Bridging Gaps through Light: An Archaeological Exploration of Light and Dark in the Atlantic Scottish Iron Age

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Abstract

Representing a broad attempt to open up debate on an issue that has been largely overlooked, this thesis aims to explore the relationship between Atlantic Scotland's Iron Age communities (and in particular, the broch cultures of Northern Scotland) and light – a complex, multifaceted, and universally significant facet of human existence. Thus far, the role of light has received little interest in prehistoric studies, and when such an interest does occur, it has often been restricted to entrance orientation research. Indeed, little attempt has actually been made to understand how light was orchestrated to shape social experience in the past, or how differing dimensions of light work to reveal or conceal aspects of social life; how was light *experienced*? What did light *mean*? Proposing an alternative approach to the study of light, these are questions which this thesis aims to explore; seeking to understand how Scottish Iron Age society orchestrated and manipulated light to create social experience.

Due to light's complexity, the thesis sections its study into a number of separate themes: structural orientation, the cosmological model and space, light and functionality, the psychological impact of light and dark, and light in the landscape and the influence of the weather and the environment. To explore each of these, the thesis pursues a plural methodology, combining typical data-based approaches (map-based studies, broad ranging landscape and GIS research; architectural-typological studies) with more qualitative analysis (e.g. phenomenology, ethnographic analogy, folklore analysis), attempting to explore both the physical and cognitive effects of light and darkness in the past.

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To my mum

In memory and gratitude

Introduction:
The Research Themes

This thesis is first and foremost a broad attempt to understand the relationship between Atlantic Scotland's Iron Age communities – and in particular, the broch cultures of Northern Scotland – and the environment, especially with regards to the elements of light and, within the latter stages of this thesis, water.

A variety of anthropological studies (see Chapter One) make it clear that light frequently acts as a polysemic social-tool; enabling people to become illuminated or shadowed, shaping moral spaces, orchestrating movement and acting as a bridge between humans and domains of non-humanness (cf. Bille and Sørensen 2007: 273). However, despite its range and complexity, the role of light has thus far only received modest interest in prehistoric archaeology, with its focus largely being restricted to light's cosmological associations. Indeed, little attempt has actually been made to understand how light was orchestrated to shape social experience in the past, or how differing dimensions of light reveal/conceal aspects of social life; how was light used? What did light mean? These are questions Scottish Iron Age archaeologists have failed to answer.

Indeed, the role of light in Iron Age Scotland has been limited to entrance orientation research. To briefly summarise here (see Chapter Four for an in-depth discussion), as the result of a move towards interpreting the use of domestic space in the Iron Age (e.g. Foster 1989a; 1989b; Romankiewicz 2011: 39-71; cf. Parker Pearson and Richards 1994), there was a growing belief among many scholars during the late 1980s and 1990s that Iron Age domestic space (especially with regards to orientation) was influenced by sun worship (e.g. Boast and Evans 1986; Hill 1993; 1995a; 1995b; Parker Pearson 1996; 1999a; Wait 1985). Oswald's (1991; 1997) work on roundhouse orientation – which noted a strong tendency for roundhouse doorways to be orientated towards the east and the south-east, and with little variation to this rule throughout Iron Age Britain – further reinforced the belief that there was a widespread sun-based belief system dictated through the use of domestic space in which people would work in the south side of a roundhouse when the sun was in the southern sky, sleep in the north side when the sun was (invisible) in the night sky, and move around the structure in a sun-wise direction (see Parker Pearson 1996; 1999a; Ingram, Marshall, Mulville and Parker Pearson 1999; Parker Pearson and Sharples 1999a; 1999b).

Essentially divorcing orientation studies from broader concepts of landscape and the role of light in framing social space, the 'cosmological model', as it has become known, has also demonstrated how the paucity of hard facts and figures in the archaeological record can result in social models being extended across extremely large areas. Of course, we cannot assume that all parts of Scotland would have had an identical social system throughout the Iron Age and we should question whether a single model can really embrace all of the different population groups in Scotland during the entire period, covering highland, lowland, coastal, inland, riverine and moorland settlements. The extension of this generalised cosmological model – reinforcing ideas of a uniform Iron Age – across Scotland, without consideration of regional or chronological variability, thus led to heavy criticism (Pope 2007; Romankiewicz 2011: 54-57; Webley 2007; cf. MacKie 2010: 104-105).

But this debate between the practical and cosmological approaches to space, and indeed, to the manipulation of light (as expressed through orientation), has also highlighted the tensions that exist between processual approaches to the record (popular in Scottish Iron Age studies, with methodologies generally modelled on the hard sciences; see: Shanks and Hodder 1995: 3-4), and those of a more post-processual nature (e.g. phenomenology; subjectivism; see: Gosden 1999; Wiseman 2001: 12). On that note, I would contend that the critiques made on the cosmological model (e.g. Pope 2007; Romankiewicz 2011: 54-57; Webley 2007; Woodward and Hughes 2007; cf. MacKie 2010: 104-105), have not only almost made redundant the idea of the cosmological model itself, but have also practically erased debate by seeming to dismiss ritualistic, and to a large extent, even subjective interpretations of the record altogether, replacing such approaches with simple and seemingly universal practicality; a practicality based on the evidence alone – an argument for archaeologists to be scientists rather than socio-cultural anthropologists perhaps (see: Binford 1987; Gillespie, Joyce and Nichols 2003: 159).

Indeed, this potentially represents an archaeology rejecting ethnographic data and cultural anthropological theory, and basing all its theory within the archaeological record itself – i.e. a purely objective discipline (Taylor 1983 [1948]: 44). This, together with the popularity of the processual approach in Iron

Age studies in Scotland[1], rejecting the somewhat post-processual approaches seen in the construction of the cosmological model for example (e.g. ethnographic comparison/analogy, issues relating to gender roles), surely represents a narrowing of our vision, and doubtless undermines the *imagination* which the individual archaeologist inevitably requires (see: Binford 1987; Beaudry, Cook and Mrozowski 1991: 161; Feyerabend 1975; 1978; Jones 2010: 303; Terrel 2003).

One should remember that in archaeology, the empirical facts usually provide a springboard for multiple understandings (Tilley 2008a: 219) – especially with regards to human agency (Dobres and Robb 2000; Knapp and van Dommelen 2008) – and indeed, both sides of this argument (of practicality and cosmology) may hold their own possible 'truths'. And yet, they are often seen to conflict with one another rather than being complementary and interconnected, which ritual and function were in the Iron Age, as they remain so today. Indeed, though recent regional studies on broch and dun orientations have demonstrated the existence of diverse regional patterns (see Crowther 2011) – thereby illustrating that the cosmological model was too quickly extended across large areas without consideration of local datasets – distinctly practical conclusions regarding Iron Age domestic space may gloss over the social and cosmological significance not only of orientation, but also of other factors which influence human action, such as light and dark.

Indeed, though I have previously highlighted the possibility that life within Iron Age roundhouses drew upon available daylight (Crowther 2011), it is also clear from this study that Iron Age society in Scotland gave particular precedence to the integration of *direct* sunlight – in contrast with daylight ambience – within the interior of the roundhouse; suggesting that light may have been sought to create and nurture social space. This is something which others have not considered when critiquing orientation research, instead assuming that as light is universally required, it must therefore be significant when orientating an entrance.

And yet, contemporary anthropological research on light strays from the purely practical conclusion that domestic lighting is expected due to its universal

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[1] Though the processual approach is certainly not the *only* approach in Scotland, and for studies influenced by post-processualism, see: ScARF (2012); Armit (1997a; 1997b); Hingley (1996); Parker Pearson and Sharples (1997); and Rennell (2010).

requirement, stressing instead how the phenomenological aspects of light evokes agency and acts as a polysemic social tool in many cultures; cultures possessing significantly dissimilar social environments; e.g. Jordan (Shryock 2004), Norway (Garvey 2005) and Japan (Tanizaki 1977). Indeed, the study of light should extend well beyond entrance orientation research.

Research on the cultural impact of light has largely been conducted by anthropologists upon modern societies rather than archaeologists focussing on prehistory. Nevertheless, this research into modern cultural perceptions of light has allowed many areas of potential interest to emerge, and includes: (a) light's ability to create atmosphere (Alves 2007); (b) the impact of the night and darkness on human behaviour (Handelman 2005); (c) light's metaphysical qualities (e.g. Coote 1992: 252-3; Morphy 1989; Bayley 1986: 291-292); (d) light's relationship with darkness and the 'Other' (Handelman 2005: 248; Heijnen 2005); (e) light's ability to change human perceptions on landscapes/waterscapes (Morris 2011); and (f) the impact of a reflective material culture and its capacity to intrigue and mesmerise viewers (Haglund 1996; Morphy 1992; Tuzin 1977).

On that note, and as shall be explored further in the following chapter, there were a variety of light-bearing objects which deserve attention in the British Iron Age; from the Ballachulish Goddess, with her white Quartzite pebble eyes, to the bronze and iron torcs. Indeed, the *circa* sixty British Iron Age mirrors, dating from the late 2nd century BC to the mid 1st century AD (Sealey 2006) certainly seem to attest to a powerfully reflective, light-bearing material culture (for research on Iron Age mirrors see: Fitzpatrick 1997a; 2007; Jope 2000: 114-115; Joy 2008: 80; 2010; Lowery and Savage 1976; Lowery, Savage and Wilkins 1971; 1976; Giles and Joy 2007; also see: Garrow and Gosden 2012; Gregory 2008; Pendergrast 2008: 2).

Likewise, many Iron Age sites in Atlantic Scotland were also likely to have been influenced by light (both practically and cosmologically), but on a more subtle and distinctly regional basis. With the discovery of features such as wells and souterrains, and enigmatic, non-domestic sites such as Mine Howe (Card and Downes 2002; Card, Downes, Gibson and Sharman 2005) and Knowe of Skea on Orkney (Moore and Wilson 2005), the impact of light on cosmology, and indeed on culture within Iron Age Scotland itself, can actually be regarded as highly individual and complex, and need not be relegated solely to orientation research.

As shall become apparent, light's integral relationship with water also seems to have been especially influential within many areas of Iron Age Scottish culture. This relationship is a strong one after all, as water shimmers with movement and, like fire (its light-bearing counter-part), it is often noted for its mesmerising and hypnotic qualities (see: Dennis 2008: 96; Haslam 1991: 281; Schiffman 1996: 179-180; 199; Watt 1991: 42; Winkleman 1986: 101). As Giles (2008: 71) has similarly suggested with regards to Iron Age mirrors, their reflective surfaces may have even aided in augury and prediction; much like the water within pools and lakes (see Addey 2008: 33; Iamblichus. 2003; Saunders 1988). This 'spellbinding' characteristic is due to the fact that light is scattered off water's surface, thereby allowing water to act as a constantly shifting light source, and it is this quality (i.e. its shimmering irregularity) which makes it so visually compelling (Strang 2004: 52). Indeed, it is well attested that Iron Age societies across Europe attributed significance to water, with its religiosity being remarked upon in the classical texts (Mela 1998: III.48; Strabo 1917-1932: IV.4.6; cf. Braund 1996: 12-21; Buxton 1994: 102-103; Derks 1998; Green 1986: 166; Webster 1995: 449-451). And it is widely accepted that prehistoric communities often gave natural places and the elemental forces within them, such as water, symbolic and ritualistic significance (Bradley 2000: 27; Braund 1996: 12-21; Hedeager 1992; Rogers 2011: 647; Willis 1997; 2007).

Such consideration is demonstrated in the positioning of Iron Age shrines near the sea (Elms Farm, Heybridge; Hayling Island; Lancing Down, West Sussex; and Worth in Kent; Willis 2007: 120), bog-body 'sacrifices' (Briggs 1995; Coles, Coles and Jorgensen 1999; Giles 2009; Glob 1969), the disposal of the dead in watery, especially riverine, contexts (Evans 2013; also see: Bradley and Gordon 1988; Chamberlain 2003; Marsh and West 1981), and the common use of riverine islands (Brown 2004; cf. Evans 2003; Evans, Knight and Webley 2007; Webster 1995).

The primary aim of this thesis then is to not only to study light's obvious influences (e.g. light's impact on doorway orientation and cosmology), but to also examine the more subtle, less understood aspects of light (e.g. the nature of light and dark within underground structures, and light's impact upon landscapes and waterscapes). This thesis thus moves away from the predominantly functionalist approaches and architectural typologies which have dominated Iron Age studies in Scotland (as to be explored in Chapter Two), and instead seeks to explore the complex relationship of light – and especially its connection to water – in the past. In order to conceptualise this overall objective, I ask three foundational questions:

Foundational Questions

1) Apart from entrance orientation research, how can one examine light in the prehistoric past?

2) How did the integral relationship between light and dark, and light and water, influence aspects of Iron Age Scottish society?

3) And finally, how can we move away from the polarized division of practical vs. symbolic models of Iron Age society in Scotland?

To answer these, this thesis is divided into numerous sections, beginning with an examination into the ethnographic concepts of light and their use to the prehistorian, as well as briefly exploring the relationship light has with water (Chapter One), before reviewing Scottish Iron Age studies in general (Chapter Two). It then splits into two popular avenues of exploration: domestic space analysis (Chapter Three – which examines the influence of the environment on the broch structure; and Chapter Four – which attempts to define the social nature of the broch 'home') and landscape (Chapter Five – which records exterior lightscapes in time and space; and Chapter Six – which examines the nature of waterscapes), with the final chapter (Seven) bringing multiple themes together to form a concise case-study of the idiosyncratic role of light and dark and their relationship to water and underground spaces in Iron Age Orcadian society.

The thesis shall begin by delving into the tangled, complex and multivaried phenomenon of light in both anthropological and archaeological social contexts. Focusing on the impact of light within exotic cultures – both past and present – the next chapter shall seek to explore our own, modern perceptions of light which can then be compared with the ethnographic, ethno-historic and archaeological literature to allow us to observe the possible differences in perception. The purpose of this 'cultural review' is to allow us to observe our own assumptions on light. Only then can I ask how we can research light's influence on those who dwelt within a society (Iron Age Scotland) where colour and light has largely been muted by time.

Chapter One

A Complex Matter: Tackling Luminescence in the Archaeological Record

Introduction: Recognising Cultural Loss and Cultural Baggage

Atlantic Scotland offers a particularly interesting test case for the study of light – a complex, multifaceted, and universally significant facet of human existence. Primarily, this is because of Scotland's seasonal and latitudinal variations in daylight and darkness when compared to the rest of Britain and Europe. For example, Northern Scotland enjoys longer summer days in comparison to areas of Southern Britain, with the sun remaining above the horizon for a much longer duration. However, the elevation of the sun – something which directly affects the growth and production of crops – still remains much lower in the sky, even during the summer (Dawson 2009), thereby determining the vegetation that can grow here. But perhaps more importantly, these long summer days are in stark contrast to the long, dark nights which affect Northern Scotland throughout the winter months. Indeed, with much of Scotland only experiencing a few hours of light per day throughout the winter, we can imagine how light must have been an essential commodity for Iron Age communities here – an element of great importance. However, before we can ask where light fits in with regards to current research on the Atlantic Scottish Iron Age, it is important to first examine the matter of light itself.

'Light' – a word deriving from the old English *leoht,* meaning luminous, and from Indo-European *leuk,* to shine, to see (Classen 1993a: 68) – has been examined both as *lumen* (light as external and objective matter) and *lux* (light as subjective and interior; i.e. sight and mental sensation) (Jay 1993: 29). But how does one approach the study of light?

Scholars such as Alhazen, Rene Descartes, Lucretius, Christian Huygens and Maurice Merleau-Ponty have all investigated the phenomenon of light by asking the initial question: 'What is light?' Other academics however have been keen to research the physical responses that humans exhibit to light (see Padgham and Saunders 1975; Perkowitz 1996; Waldman 2002). And like those mentioned, this research on light requires an initial question. To ask, '*what is light?'* may narrow one's approach however, as to answer that would require an objectivity, distance and method that should largely remain outside the social sciences. As this thesis represents an attempt to relate the different variations of light (e.g.

incandescence, brilliance, dimness, crepuscular, and opaque) to the people of the Atlantic Scottish Iron Age, I would rather ask questions such as: 'how does light effect people?', 'how do people sense light?', 'how can light be manipulated for social ends', and 'how can we research light's influence on those people who dwelt within a society where colour and light has been muted by time?'

Such questions have not been investigated sufficiently in archaeology, especially in relation to light's socio-cultural boundaries, and this perhaps relates to the cultural baggage of the archaeologist. In our modern ability to control light, light has clearly been taken for granted. Our capacity to simply flick a switch and turn night into day by way of the enclosed vacuum-sealed incandescent light bulb – a smokeless, fireless and apparently inexhaustible light source – is proof of our growing manipulation of even the most basic diurnal rhythms of nature (McQuire 2005: 127). Electric light, now representing an omni-present force in our lives, has allowed us to defend ourselves against the darkness of night and shadow, and against the primal nature that the darkness induces; a theme that has previously placed us in the realms of possible danger (see Chapter Seven for a discussion on the 'danger' that the dark engenders). However, the price of this control represents something of a cultural loss.

We can see this loss in the cultural differences between the non-industrial night and the modern (Ekirch 2001; Verdón 2002; Wolkomir and Wolkomir 2001). Helms (2004: 179), for example, argues that in the pre-modern cultures of late Antiquity and Early Middle Age Europe, the inability to master the darkness as thoroughly as in the modern world meant that night, and the dark, was seen to be a much more serious concern, constituting a distinctive 'night-season'; a Medieval term espousing a condition that was in complete contrast to day (cf. Neale and Littledale 1976). However, in modern, industrial cultures, the relationship between night and day, dark and light, has been reversed and 'instead of giving away each evening before the all-encompassing inevitability of the coming dark and uneasily sensing the advent of its supernatural otherness, industrial peoples send night packing and make physical light triumph over natural dark' (Helms 2004: 179).

Such research illustrates the ways in which the western standardisation of light has stripped light of its metaphysical qualities by objectifying and classifying it; a huge obstacle for any archaeologist wishing to tackle and understand the impact of light in the past. The pervasiveness of electric light has also permitted many modern spaces to be filled with monotone light (see Kahn 1970: 252), within which the moods which light give to space vanish. The ways in which we now react to light represents a significant loss of cultural perception then, allowing many to not only forget the subtle mystical qualities of light and dark, but also the endlessly changing qualities of natural light, in which a room can be a different room every second of the day (see Tanizaki 1977: 34). Assuming then that the modern person possesses a somewhat diluted cultural preconception of what light represents, and what light can do, how would he/she approach the topic for a culture which possessed a very different perspective on light?

For the anthropologist, the differences between one's own views and that of the culture in question can be somewhat bridged, as he/she is able to be immersed within that society. Of course, although any ethnographer's 'outside' interpretation of a culture is often erroneous and/or politically and morally guided (e.g. Mead 1928; cf. Freeman 1983), he/she is at least given the chance to attain the 'insider view' by reviewing cultural histories and first-hand accounts (see Geertz 1976; Rosaldo 1989; Schutz 1964). The archaeologist however – and especially the prehistorian – is usually dependent on the surviving material alone, and this represents a serious drawback with regards to interpretation, especially in relation to ephemeral phenomenon such as light. The focus of this thesis (Iron Age Atlantic Scotland) lacks the cultural histories which help give life to the material record, and which allow us to comprehend the significance which was granted to light. But there is another issue at hand – the nature of Iron Age studies in Scotland.

As shall become clear, the British Neolithic has generally been regarded as characteristically different and 'Other', and as such, archaeologists working on the Neolithic have perhaps been more able to examine the record using distinctly subjective methods (e.g. by examining the acoustical properties of cairns, for example; see Watson 2006). It is perhaps for this reason that the complexities and intricacies of light (and colour) have been studied – whether tentatively or in-depth – within British Neolithic studies (e.g. Boric 2002; Bradley 1989b; Cummings and Fowler 2003; Darvill 2002; Jones 1999; Watson 2004; for Iron Age examples on light and colour, however, see Giles 2008: 65; Giles and Joy 2008: 24). As Hill (1989) has argued, in the past, the Iron Age has often been regarded as unproblematic, safe and 'familiar'; a past where our modern, historically specific values and common sense notions apply – a familiar past (1989: 17), focusing mainly on familiar aspects (e.g. subsistence and economy). It may be for this reason that light – an element so often taken for granted in our own society – has not been given the same degree of attention. Because of this, studies which have explored the role of light in Iron Age Scotland have been narrow, as noted in the introduction, and have been restricted to that which seems most obvious – i.e. light's cosmological associations with doorway orientation.

Of course, there are many ways in which light impacts and touches upon life which have not been explored at all, and it is therefore important to begin this thesis by widening the scope of our current appreciation on light by examining how light was used and manipulated within societies possessing a clearer record than that which we possess for Iron Age Scotland.

The use of ethnography in archaeology has been discussed in depth, especially in relation to its use as an analogical tool (e.g. Anderson 1969; Binford 1967; 1968; Clark 1968; Crawford 1982; Green 1973; Lyman and O'Brien 2001; Terrel 2003; Wylie 1982). For the purposes of this thesis however, my aim in reviewing the ethnographic record on light is to simply allow us the ability to observe our own assumptions and to therefore not only comprehend how complex light can actually be, but to also permit us to examine the archaeological information in a new and different way.

An Element of Infinite Variety: Light and the Material Record

To comprehend how differently modern humans perceive light, I turn to anthropology, which has gained significant advances with regards to the study of light, particularly the perceived spiritual qualities of light and colour; a theme remarked upon by Coote (1992: 252-3) for the African Dinka and Nuer; by Gell (1992a: 45) for the inhabitants of the Pacific Island Trobriand; by Morphy (1989) for the aboriginal Australian Yolngu of the Arnhem lands; and by Bayley (1986: 291-292) for Indo-Persian culture. However, one of the most dominant areas of study with regards to the aesthetics of light, and the one which may be of most interest to the archaeologist, is that of material culture.

The role of light within the material cultures of South and Central American societies is particularly prevalent in the literature, with Saunder's (1998; 1999; 2001; 2002) work being especially influential in this regard. His research on the aesthetics of light and brilliance throughout pre-Columbian America (Saunders 1998; 1999; 2002) has revealed the common indigenous belief that light emitting materials and shiny matter were the physical representations of light and were thus charged with cosmological power; something which could grant social prestige on individual owners. What is most significant in his work, however, is that in attempting to understand indigenous conceptions of 'brilliant materials' and their ritualistic and symbolic associations, Saunders attempts to dismiss the western economic value that is often assigned to shiny materials, especially that of gold and silver (1998: 225). Indeed, the holistic philosophy of light held by many indigenous populations in America tells us that their appreciation of light-emitting objects contrasts sharply with the European worth of brilliance, which may be argued to lie instead in gold content and flawless gemstones; essentially, materials which hold great commercial worth (though we should not forget the subtle religious symbolism attributed to certain metals in Medieval European society; see Kunz 1971: 256-274; Nicholl 1996: 323-324). For many indigenous communities in the Americas, the value assigned to shiny materials lay instead in a belief that brilliance was the manifestation of differing forms of spirituality. Indeed, spirituality and spiritual essence were thought to materialise themselves as brilliance throughout various American cultures and were imbued within many things that shone, including: fire, water, metals (e.g. gold, silver, copper), shells, ceramics, feathers, bone, blood, sun, moon, stars, and meteorological occurrences like comets; all of which revealed an inner purity and sacredness by projecting and emitting light (Lechtman 1993: 269).

For Amerindian society, shiny objects held multiple connotations and meanings however. For example, for the Kogi, gold and gilded copper ornaments were not objects of commercial value, but were instead symbolically significant of the sun and were exposed outdoors to capture sunrays, the power of which could then be granted to priests in subsequent rituals (Reichel-Dolmatoff 1981: 26). It was the same for Aztec pochteca merchants who would lay out their elite and shimmering items to be exposed to the sun, allowing them to be filled with sacred energy (Lépez Austin 1988: 228); whereas the warriors of the Inka emperors wore shiny metal plates (pura-pura) on their chests for the purposes of reflecting the strength and power of the sun whose rays it had captured (Saunders 1998: 229).

These demonstrate the ways that brilliance (and the power attributed to it) can be manifest in metals, a theme which is prevalent in the literature (also see: Hosler 1994: 241-243; Reichel-Dolmatoff 1981: 22-23). However, though metals are an excellent means of conveying a concept of brilliance through reflection and shininess, there are many other materials that emit and reflect light. For example, minerals and rock crystals that shine are far more numerous and their cultural significance seems much older. And indeed, the anthropological and ethnohistoric literature is crammed with references to the relationship between stone, rock crystals and light. For the Aborigines of Australia, rock crystal is not only seen to be of celestial origin, but is actually considered to be 'solidified light' (Eliade 1974: 137, 508), whereas in South America, the Makiritare believe that when the many forms of light unite, heaven and earth will merge together and shine like the crystal that is believed to make up the creator himself (Sullivan 1988: 562). Further, throughout the Americas, rock crystals are highly sort after for their magical and curative qualities (e.g. Dow 1986: 108-110; Sharon 1978), with the shaman of the Amazon, for example, highly prizing crystals, which are amongst their most significant power objects (e.g. Hugh-Jones 1979: 121). The Aztec held high regard for mica, which was believed to originate from the moon, possessing of a soft and buoyant light and representing cosmic powers (Sahagún 1950-1978: Vol.11: 235; also see Moorehead 1922: 91-92). The Aztec further prized the glistening surface of greenstones which symbolised fertility and were believed to emit smoke at dawn, passing on their greenness to the flora surrounding them (Sahagún 1950-1978: Vol.11: 221-222).

Such shiny materials (e.g. mica, greenstones, jade, shell and magnetite) were symbols of high status in the early hierarchical societies at San Jose Mogote in Mexico's Oaxaca valley around 1150 BC (Marcus and Flannery 1996: 93, 101-103), and this pairing of brilliance with status may have even influenced the Inka social system, in which high rank was symbolised though brilliant white and shiny material culture, whereas lowers classes were associated with darker colours and blackness (Mester 1990: 213). Indeed, brilliant materials appear in cultural contexts across the Americas; copper and mica in North America, greenstones in Mesoamerica, metals in the Andes, polished wood and guanine in the Caribbean, and rock crystals in the Amazon, all of which can be regarded as a manifestation of a pan-Amerindian philosophy of light (cf. Hamell 1983: 5), something which may have been influenced by a shamanic appreciation of light (Saunders 2002: 213). Indeed, Shamans, moving between the physical and supernatural realms, immerse themselves in visions aglow with shimmering and often multicoloured light (see Furst 1972; Harner 1978; Kensinger 1995: 221; Wilbert 1987), by which supernatural beings, luminous and brilliant can often appear (Ford 1969: 74-75; Furst 1976: 46, 131; Goldman 1979: 210; Taussig 1987: 322-323).

The concept of light – and its sacred, mythic, moral and social values – is thus manifest in the material record of many different cultures, and the archaeologist should attempt to recognise the possible existence of such a record in the materials of prehistory. One possible avenue of research relates to quartz rock and its light bearing – or even light capturing – qualities, which feature prevalently throughout the anthropological and archaeological record. Indeed, cross-culturally, quartz crystal seems to be highly regarded. Hamell (1983), for example, states that for the Chippewa-Ojibwa and Seneca Iroquois, quartz was connected to rites of shamanic curing, divination and the soul, as were other reflective items (e.g. glossy fish scales, brass and copper; also see: Hamell 1998). He later describes that in North American Navajo Athapaskan mythology, quartz crystals denoted ‘clear seeing’ and ‘consciousness’ (Hamel 1986: 58), which we may associate with the ‘clear seeing’ of shamanic vision, of which Saunders (1998: 266-30) argues to be widely regarded as seeing the essence rather than the surface of things, much like the way in which an item’s shiny or coloured surface may reveal the sacred glow that is within it. For the Aborigine, ancestral power (being present within brilliance and colour) is likewise believed to be harnessed within quartzite quarries where the brightest and most colourful light bearing materials can be found (Jones and White 1988; Jones 1990; Taçon 1991).

The evidence for quartz revering customs is apparent in the archaeological record too. Indeed, quartz seems to have held a special place within the minds of Britain and Ireland’s Neolithic communities, especially those around the Irish Sea region (see Cummings and Fowler 2003: 6-8; 2004: 119; Darvil 2002; 2004: 50-52; Davey 2004: 141; Fowler 1999; 2001; 2002; 2004; Frieman 2008: 145). Eogan (1986: 47) and Mitchell’s (1992) work at Knowth in Co.Meath, and

O'Sullivan's (1993; 1996) research at Knockroe in Co.Kilkenny, are particularly enlightening in this regard. Indeed, assuming that in the British and Irish Neolithic there existed a possible relationship between light, colour, stone and rock crystals, it has been argued that such significance may also have been attributed to other materials possessing reflective qualities i.e. polished stone axes, flint, etc (see Bradley 1990; 1995; Bradley and Edmonds 1993; Chappell 1987; Clough and Cummins 1979; 1983; Cooney 2002; Cooney, Grogan and Sheridan 1992; Darvill 1989; Hodder and Lane 1982; Pitts 1996; Sheridan 1992). In the British and Irish Neolithic then, the possibility that there existed a network of reflective and brilliant materials is something that needs to be explored further, especially in relation to the apparent exchange and mobility of polished stone axes (cf. Ray 2004: 161). Emerging from the bright white chalklands as gleaming nodules, the contrasting darkness of flint also has a shininess that is emphasised by its silica content; another possible influence that should be explored further in relation to Neolithic use (Cooney 2002).

Yet the differing properties of colour need to also play a role in interpretation. Take for example the Irish passage graves; the structures of which were built of stones of differing colours and lithology (see Bergh 1995; Cooney 2000: 135-138; O'Kelly 1982), and because of the architectural arrangement of these monuments, the experience of such colours change according to the time of day, month, or year (Bradley 1989a; Jones 1999; MacGregor 2002). As Jones and MacGregor (2002: 2) also point out, the use of coloured stone in Ireland, especially quartz at Newgrange, has also been believed to effect the direction of light into the dark interior of the monument, implying that entrance orientation was significant, a feature that was influenced by light and was certainly influential in the British Neolithic. Indeed, the chambered cairn and passage grave phenomenon seem to have been designed to capture light within monumental structures.

The possible social significance attributed to brilliance and colour need not be confined to the Neolithic material records of the British Isles and Ireland however. Chapman and Gaydarska's (2008) work on the role of colour and light in the Neolithic and the Chalcolithic of the Balkans is particular revealing as it identifies three successive phases of Balkan prehistory, each of which shared a general aesthetic of colour and brilliance. In the 'Early Farming Period', Chapman (2007) notes how regional groups acquired and exchanged small numbers of objects from outside their locale, creating in the process a new visual identity that was based upon the striking colours and brilliant effects of fine painted, slipped and burnished pottery. In the 'Mature Farming Period', he goes on to describe how dark burnished wares spread across the southern Balkans (Garašanin 1954); their black shiny surfaces mimicking the brilliance of obsidian artefacts, which may suggest a colour symbolism and aesthetic appeal with black and dark colours. And in the 'Copper Age', it is noted that the emergence of heavy cast copper objects – predominantly axes, chisels and daggers – may be suggesting a focus on 'flashing blades', colour and luminosity (cf. Keates 2002).

In a similar vein, Keates' (2002) discussion on the North Italian Copper Age (3500-2300 BC) demonstrates that the solar imagery on stelae, as well as the orientation of stelae alignments toward the sunrise and other celestial phenomena (Fedele 1990; 1995; 1999), denotes that the luminous properties of copper played a significant role in the creation of cosmologies, and also in the development of the idea that luminosity was a signifier of otherworldly and ancestral presences. Moving beyond the European Neolithic however, into the Late Bronze and Iron Ages, Keates further argues that there remained a connection between shiny metal objects and their deposition in the reflective luminescent contexts of watery locations (Keates 2002: 122; cf. Bradley 1990b); a theme to be explored in chapters six and seven.

For the British Iron Age too, there were a variety of light-bearing objects which deserve similar attention; from the Ballachulish Goddess, with her white Quartzite pebble eyes (reminiscent of the veneration of quartz in the Neolithic perhaps; see Christison 1881), to the bronze and iron torcs. However, though there are many examples of brilliant, reflective objects within the British Iron Age record, it is the *circa* sixty British Iron Age mirrors, dating from the late 2nd century BC to the mid 1st century AD (Sealey 2006), which are perhaps the best example of a reflective, light-bearing material culture; nearly half of which were decorated with abstract insular Celtic Art (for research on Iron Age mirrors see: Fitzpatrick 1997a; 2007; Jope 2000: 114-115; Joy 2008: 80; 2010; Lowery and Savage 1976; Lowery, Savage and Wilkins 1971; 1976; Giles and Joy 2007; also see: Garrow and Gosden 2012; Gregory 2008; Pendergrast 2008: 2). With regards to light, Giles (2008: 71) has suggested that rather than cosmetic items (Fox 1958: 122), the reflective surface of the mirror may have even aided in augury and prediction; much like the water within pools and lakes; a theme explored further in Chapter Seven (see Addey 2008: 33; Iamblichus. 2003; Saunders 1988). Indeed, with many reflective objects also being deposited in water bodies in the Iron Age (see Coles 1990; Fitzpatrick 1984; 2005: 161; Warner 1991; cf. May 1992: 97), it does seem, however, that this link between water and light was an important one.

This link between water, light and material culture also demonstrates a significant point: that the significance universally attached to light, though visually manifest in material cultures around the world, is perhaps best personified within natural features and supernatural phenomena (e.g. comets, eclipses and the aurora borealis), and this is a theme recounted in countless cultural contexts; thereby deserving further attention below.

Cosmic Light: The Influence of Natural Phenomena

Out of all natural phenomena which produce light, it is perhaps unsurprising that the sun, as the brightest object in the sky, represents the fountainhead of a global array of religions and divinities, usually representative of supreme cosmic power. To Amerindians, it is the universal spirit. For Buddhists, the light of the sun is Buddha; for Hindus it is the 'eye of the universe', and for Muslims, it is the all seeing and all knowing eye of Allah. It is symbolic of the divine and God's will and guidance for the Jews and a symbol of righteousness for Christians (Cooper 1978). In Gaelic, the word for sun is *grian* or *griene*, from *Dia Griene*, or sun goddess (Weightman 1996: 61), and indeed, Roman Catholics fixed Christmas Day on the Feast day of *Sol Invictus,* the feast of the unconquered sun (Warner 1983). The sun also poses as a variety of divinities: Inti, the Inca sun god; Amaterasu, sun goddess of Japan; and Maui, son of the sun in Polynesia; not disregarding the pantheon of Russian, Siberian, Slav and North American tribal peoples focus on sun gods and goddesses (Baumgartner 1984; McCrickard 1990).

For many cultures, light and brilliance emitted from more subtle natural phenomena can also manifest spirit and cosmic essence. For example, rain, clouds and rainbows are all highly regarded by many cultures as elements shimmering with spirit essence and cosmological power (Garcilaso de la Vega 1987 [1609]: 183; Mester 1990: 198; Seler 1993: 195; Stevens-Arroyo 1988: 190-191). For many Amerindian cultures, mountains and volcanoes, covered in shining sheets of snow and ice, were thought of as spirit-dwellings and portals for the dead where weather was produced (see: Reinhard 1988: 365-370; Townsend 1987: 373). The Colombian Kogi for example, perceived snow covered mountains as shining white crystals of light that could be entered by the dead (Reichel-Dolmatoff 1981: 28), whereas for the Inka, they found such locations to be ideal for human sacrifice to a variety of sky and mountain deities (Reinhard 1992; 1996: 62-81).

The Inuit associated their games with similar light phenomena and it was believed that as the dead danced in heaven, it would manifest itself as the aurora borealis (Zajonc 1993: 241). Such importance of sky light is also witnessed in the Inka's belief that the creator god, Viracochas, created the sun and moon (Classen 1993b: 37), and during Coya Raymi – the Inka festival of the queen – the moon was rejoiced in, and through celebration and the use of warriors brandishing fire slings, the attributes of darkness (e.g. illness, disease), were expelled (Saunders 1998: 229).

Moving beyond the indigenous cultures of America, we find similar associations between light and cosmic significance. In northern Australia, the brilliant colours of the Rainbow have long been held as significant; something we witness not only in oral history but also in rock art and stone tools (Taçon 1989: 123). The frequent use of cross-hatching in depictions of the Rainbow Serpent, the most powerful embodiment of brightness and colour (Taçon, Chippindale and Wilson 1996: 120), emphasises how the various colours create a powerful visual effect on observers. Depictions are thus made to appear as intense as possible because the bright colours that emanate from the serpent are associated with life, whereas the absence of light and colour denotes death.

Indeed, in worlds where brilliant light is perpetually instilled with life-providing and healthy qualities such as those described above, it is often the case that there is a conflict with the absence of light, i.e. darkness. With regards to natural phenomena, the absence of light is probably best demonstrated during eclipses. Closs (1989: 390-394) has previously drawn up a list of indigenous reactions to solar eclipses, all of which seem to associate them with death, catastrophe, illness and world destruction (cf. Sullivan 1988). It is no wonder perhaps that in such worlds where bright light is revered and eclipses not yet calculated that a solar eclipse and its ability to create darkness in the day would be so terrifying and thus be associated with dangerous social and religious elements. Yet other light phenomena, such as comets, have, in many societies, similarly been feared as prophecies of war or starvation, e.g. in the Americas, including the Aztec (see Carrasco 1989: 51; Köhler 1989: 289-290; Lépez Austin 1988: 351) and the Kogi (see Reichel-Dolmatoff 1981: 25).

What these examples demonstrate are the ways in which the different variations of light and dark – whether expressed through materials (e.g. crystals, metals) or through environmental phenomenon – can act as analogies and metaphors for human conditions (e.g. death, fertility, etc.). I would stress here, however, that light-dark are not distinct opposites (or binaries, like life/death), but are, in fact, polarities of varying degrees. However, polarities can create metaphorical tendencies that inspire and influence human action, and so many cultures may relate the dawning of the rising sun, for example, with life and brightness, and the sun's setting (and the resulting state of darkness) with death. Indeed, there is a tendency in many cultures to metaphorically associate lightness with health, fertility and goodness, and darkness (or at least, variations of darkness) with death, illness and evil (see Closs 1989; Halliwell 1996; Strathern and Strathern 1971).

This kind of dichotomy between light and dark is not a universal however, and the absence of light (i.e. darkness) is not always associated with that which is negative either. Indeed, the darkness can be highly immersive, linked to fertility and creation (e.g. the darkness of the womb); while also protecting or camouflaging people from the potential dangers of revelation. Furthermore, as we also fall sleep in the dark – falling into darkness as it were – darkness can often be associated with dreamscapes (which themselves, offer revelations to the dreamer), the unconscious, the 'Other', and the primal (Handelman 2005: 248); all of which are not necessarily negative or 'evil', as to be explored in Chapter Seven. However, in many cultural contexts, the perceived conflict between lightness and darkness (which is, in essence, that of revelation and concealment) can parallel the conflict which exists between particular human conditions (e.g. life and death; health and illness; fertility and barrenness; good and evil), and indeed, the anthropological, historical and archaeological literature is replete with analogies and symbols relating to this powerful relationship between the different degrees of light and dark.

Lightness and Darkness: Using Light as a Moral Constructor

An apparent conflict between lightness and darkness seems very clear in the Americas at least, with lightness often being imbued with moral, social, holy and mythic values (Saunders 1998). As we may expect, bright light was perceived most positively, while its absence – variations of darkness – tended to hold negative qualities. For example, the Aztec believed that their soul was luminous, as witnessed in shamanic visions within the mirror world (Lépez Austin 1988: 204-206, 216), and so if an ill child's reflection was bright, his soul was thought to be unharmed; but if it were dark or shadowed, it had already escaped (Lépez Austin 1988: 216). The presence of bright light and colour was thus equated with life, and its absence with death; a theme which seems quite prevalent in the anthropological and ethnographic literature, with another such example regarding Halliwell's (1996) description of her experiences whilst she was ill when conducting fieldwork on the Longhouses of the Dayak of Borneo. Her illness forced her to stay abed and leave the light turned off in her room. However, the resulting shadows in the room made the indigenous people apprehensive to help her (Halliwell 1996: 139) because light was expected to aid in her recovery by leaving through small gaps in the room's walls and taking the 'darkness' of the illness away with it. For the Dayak, light was thus attributed to social wellbeing and health, and was a feature in the social technique of revealing.

Another similar example concerns the people of Mount Hagen, New Guinea, of which Strathern and Strathern (1971) discuss their complex subtleties of colour and brightness. They note how variations of darkness are connected with poison and warfare, and signify dangerous elements within society. Contrastingly however, the bright shimmer of oil and grease on the skin denotes a healthy, fresh body as opposed to the matte, grey surface of the dry, unhealthy, dying or dead body (1971: 156-163). Similarly, with regards to the Australian Yolngu, Morphy (1992: 196) describes how natural substances such as blood, ochre and fat are thought to be ancestrally powerful due to their shine and when applied to the human body in ritual, they provide it with a symbolic sheen. The application and rubbing in of such substances upon recipients is thought to enact a transformation in the person from dull (human) to brilliant (spiritual); from dark to luminescent, much akin to the brilliance of ancestral beings.

Our own culture (i.e. western society) is likewise strongly influenced by a dichotomy which distinguishes light and dark from one another (often associating them with good and evil); something which is due, in part, to the Christian perspective on light. Indeed, the Genesis creation narrative recounts how God separated light from the dark in the beginning – with God defining the light as 'good', and thereby distinguishing its goodness from darkness (Genesis 1:4). A dichotomy between light and dark is thus very strong in Christian theology, with darkness often considered to be a manifestation of evil and sin; and lightness, being linked to holiness and sacred visions. The apparitions of the Virgin Mary at Fatima, Lourdes and San Damiano, for example, were all accompanied by visions of brilliant white light (Zimdars-Swartz 1991), and Christian history is replete with circumstances in which light and colour in brilliant and radiant forms disclose events and messages from divine beings.

Such is the pervasiveness of dramatic colour and light in Christian visions that, over time, it has influenced the creation of a theology of brilliance, with much of Christian discourse centring on the phenomena of light (Benz 1977). The presence of brilliant light proved the eternal presence of an immaterial God and the Christian process of becoming and appreciating this pervasive force involved their extricating themselves from worldly desires and stepping beyond it, 'into the light; (Sennet 1994) – one reason why conversion in Christianity is seen as 'illumination'; stepping away from the 'darkness' of sin, as it were.

This analogy relating goodness with lightness is so powerful in Christianity that natural light is deftly and habitually manipulated in Christian spaces to help 'reveal' and 'clarify' emanations of the divine. At once awed and mystified by the interplay of light and shadow, viewers are inspired to commune with the holy. Indeed, in Christian spaces, a sense of the sacred is evoked through the glitter of jewels, Byzantine mosaics, the luminosity of gold-leaf embellishments, the soft, rich sheen of marble, and the heady colours of the artistic achievements of the Renaissance. In the Cathedrals of the twelfth-century, vaulting and the flying buttress allowed light to fill the nave, symbolically representing the holy light that fills the heavenly city of Jerusalem in the Book of Revelations (Duby 1981) – 'And the city had no need of the sun, neither of the moon, to shine in it; for the glory of God did light it, and the Lamb is the light thereof' (Revelation 21:23) – thus metaphorically bringing humanity closer to the realm of the holy (Anderson 1985). For the Gothic Cathedrals, the clerestory (from the French '*clair'*, meaning light) permitted rays of light to enhance the nave below (Whone 1990), and was accompanied by richly coloured stained glass windows that could dramatise the effect of incoming beams of light.

This Christian manipulation of light reinforces the transformation of a secular building into a sacred space (Lang and McDannell 1990; Walter 1988), symbolically creating heaven on earth. But what this brief example demonstrates is the way in which light, as a metaphor and analogy in Christian theology, is used to construct social and moral spaces. Indeed, light can do more than just create a sense of awe in us by showering our senses with brilliance, for it can be skilfully manipulated in space to reveal power relations, ethics and moral codes, while also facilitating social life.

For example, the ways in which light reveals certain aspects of social life are to be found in the customs of the Jordanian Bedouin. For the Bedouin, hospitality is of utmost importance and is linked to reputation, charity and honour. It is also felt to be a form of control and involves a great deal of 'impression management' (Dresch 2000: 115; Lancaster 1997: 82-4; Nippa 2005). Shryock (2004: 36) has argued that acts of hospitality undertaken must be carefully orchestrated to protect against social critique. That hospitality adopts a material element in the quality of coffee, tea, food, and the things presented – and perhaps more importantly, *not* presented. However, the impression that the guest develops of the house is often also dependent on the amount of space that is offered to them, an element that expresses the hospitality and honour of the family and indicates the equal importance of host and guest as 'members' of the family (Lancaster 1997: 161). As Bille and Sørensen (2007: 278) note, light becomes an important element in the production of such hospitality, as the intensity of the light source enables people and objects in the room to be fully illuminated and to create shadows, thus shaping a unique perception of the room and those within it, and thereby reflecting the reputation of the host. It is by revealing and orchestrating space through illumination and shadow within the home that the 'moral space' can be created and maintained. In this way, light is subtly manipulated to reveal, conceal and create a sense of social space in the Bedouin home.

Another appropriate example of how light can be manipulated to form social space regards Garvey's (2005) study on Norwegian perceptions of domestic privacy and visibility, in which he attempts to counter the popular belief that

Euro-American home life has turned progressively inwards and is gradually emphasizing the intimacy of home away from the public realm of the street (cf. Halle 1993; Löfgren 1984; Putnam 1999: 147). Discussing the use of lighted candles and lamps in Norwegian houses, something that is associated with feelings of homeliness and pleasant domesticity (cf. Bergan and Dysthe 1994), Garvey (2005: 168-169) argues that by setting light sources upon tables situated under windows, light transforms the window into a decorative feature which is primarily oriented towards strangers walking outside and who's eyes are then naturally drawn towards the light, and thus the house. This, he believes, is not only intended to draw attention to the 'beacon in darkened surroundings' (Garvey 2005: 169), but that it is also meant to divert attention away from the interior. It is thus a form of impression management in which the exterior gaze does not seem to be unwelcome, but privacy is maintained through distraction; the viewer's eyes fixed on the candle light, an element that is granted an aura of homeliness in Norwegian culture. Public and private boundaries are thus made to appear indistinct by the simple coordinated use of light.

Anthropologically speaking, Garvey's (2005) account demonstrates that it is not necessary for us to go to far flung regions or deep into the past to investigate how the different degrees of light are used and manipulated in particular ways (see: Angel 1994: 15; Begemann, van Beld and Tenner 1997; Delyser 2010; Gage 1995; Gombrich 1988; Miller 1998; Morris 2011; Nye 1994: 177; Rivers 1999). Other notable examples include: the use of candlelight and fireplace light to improve intimate spaces; the creation of extraordinary displays of light to 're-energize' urban areas and to instigate a sense of awe (Alves 2007); the Christmas illuminations of cityscapes to create feelings of festivity (Edensor and Millington 2007); and street lighting, and the feelings of safety that are created within their spotlights upon city pavements (Painter 1996).

For the purposes of this thesis however, what do the above examples demonstrate, and how might we use them to create an approach for the Atlantic Scottish Iron Age?

Conclusion: Approaching Light in the Atlantic Scottish Iron Age

The above reveals the complexity and variance with which light and dark are given significance. This brief account of ethnographic, historical and archaeological observations clearly shows that humans have long held bright and colourful materials and natural phenomena to be significant and powerful (Clark 1986). However, underlying this fascination with brilliance is the fact that the different degrees of light are often used as symbols and analogies; which, in turn, inspires human agency.

The problem, however, is that light is one of the most multivariate elements in the universe, especially with regards to the ways it can be experienced and manipulated for social ends. This means that the manner in which the different degrees of light were utilised by Atlantic Scottish Iron Age societies are going to be difficult for the archaeologist to gain, as the subtle cultural details which are inspired by light are troublesome to attain even in living cultures, let alone those of prehistory. In comparison to the brilliant, multicoloured worlds of the Aztecs and the Aborigines, the colours and light of Iron Age Atlantic Scotland have been muted by time and the period is comparably bare. Though we can be fairly certain that the different degrees of light were used as metaphors and analogies by the people of the Atlantic Scottish Iron Age, the histories, folklore, and stories which are influenced by light (whether that is light from natural phenomenon or from material objects), are largely missing from the Iron Age record of Scotland. The ways in which the light constructed social values is thus hidden – a disadvantage which is in no way aided by our own modern preconceptions of light, as noted at the beginning of this analysis. So how do we begin to approach the topic of light for such a society?

What the examples above do allude to is the fact that, socially speaking, light acts as a polysemic social-tool; enabling people to become illuminated or shadowed, shaping moral spaces and hospitality, exercising social intimacy and inclusion, orchestrating movement and acting as a bridge between humans and domains of non-humanness through orientation and site-emplotment. Lightness and darkness can also clearly work as metaphors; they help give meaning to spaces, and they can be used as a way of expressing status. However, all of these raise a significant point which underscores the approach this thesis shall take: light is always an integral part of a much larger social picture. And as light is the theme to be examined in this thesis, the most obvious course of action would be to first isolate the concept of light (which I have attempted to do here) and to then construct a list of possible avenues of exploration for Iron Age

Atlantic Scotland. However, the complexity and diversity of the examples noted above demonstrates the difficulty in such an approach.

As noted, in its social context, light is infinitely diverse as it is tied into, and acts as a medium, for a huge variety of customs, symbols and meanings, all of which cannot be separated from the whole. The only path open, therefore, is to take a broad approach to Iron Age studies in Scotland with the belief that light is intimately interconnected and explicable only in reference to the whole. As a result, I would argue that the course this thesis must take is to first construct a social and environmental picture of Atlantic Iron Age Scotland – utilising broad themes, issues, and interests that crosscut the sub-disciplines (e.g. ethnography, field archaeology, anthropology, geography, statistical analysis, phenomenology; cf. Borofsky 2002) – before even beginning to examine how light, as a social medium and analogical tool, may have worked as a powerful social agent – in its relationship with people, things, colours, shininess and places – within that picture. To do that, this thesis continues by outlining the context of other Atlantic Scottish Iron Age studies, before explaining: (1) where such an approach may fit in with this research; (2) where the complex issue of light has already been studied; and (3) how and where this can be improved upon.

Chapter Two

The Atlantic Scottish Iron Age: Scope and Themes

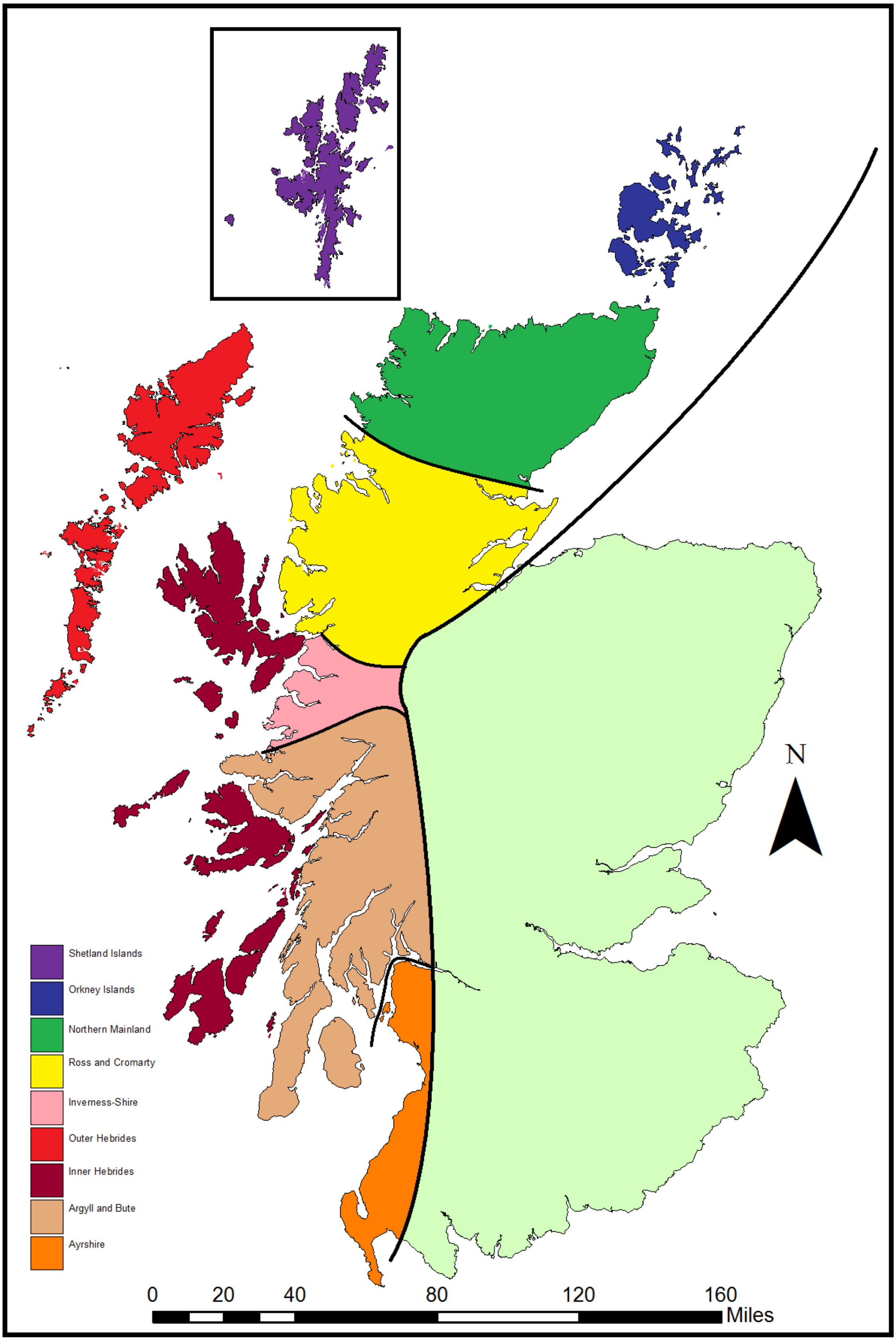
Introduction: A Complex Picture?

Following on from the previous chapter, I shall now examine the past and current research on the period which I am most interested in – the Middle Iron Age (*circa.* 200 BC to AD 200-300) of Atlantic Scotland; a period rich in well-preserved and elaborate architectural traditions. Notably, the region also possesses a long and excellent history of excavation and research, and indeed, a significant number of archaeologists have worked here – on single sites, complex settlements and landscapes – with the following presenting their contributions; the purpose of which is two-fold.

First, I wish to ask where the issue of light may best be studied in Scotland; and second, I want to contextualise this thesis and place it in the wide scope of contemporary Scottish Iron Age scholarship. This is particularly important, as it is by revealing the strengths, limitations, complexities and direction of current research that one can begin to create avenues for further exploration (especially with regards to the study of light), and ask where Scottish Iron Age society can best be studied; i.e. settlement, landscape, subterranean contexts (e.g. caves, souterrains), material culture and entrance orientation.

However, before reviewing past and current research, it is important that I briefly describe the context of these studies – the Atlantic Scottish Iron Age. As defined by Piggott (1966), MacKie (2000: 99) and Henderson (2007: 150), 'Atlantic Scotland' – largely separated from the rest of mainland Scotland by high, rugged mountain barriers and often dangerous seaways – constitutes the Western Isles, Skye, Argyll, the Inner Isles, the Northern Mainland and the Northern Isles (Figure 2.1). Containing good amounts of agricultural and grazing land (though often in isolated patches), the region is dominated by the archaeology of settlement and settlement design, behind which lie the people of the Iron Age, the root of this study on light. However, the large hillforts seen most numerously in Southern and Western Britain are rare here (with some even being Neolithic in date; see: Hingley 1992: 18), and instead, the Iron Age landscape is dominated by isolated domestic constructions (Hingley 1992: 18-19; 1995: 185). For Atlantic Scotland, as indeed for much of Britain (in contrast to the near Continent), the vast majority of these are represented by circular houses – i.e. the roundhouses.

Figure 2.1. The Areas of Atlantic Scotland. After: Henderson (2007: 150).



Persisting from at least the 2nd millennium BC and into the early to mid 1st millennium AD (see Barber 1997; Carter 1993; Fairhurst and Taylor 1971; McCullagh and Tipping 1998; McIntyre 1998; Mercer 1996; Stevenson 1984),

Figure 2.2. Distribution of the different forms of Scottish Iron Age roundhouses discussed in this chapter.
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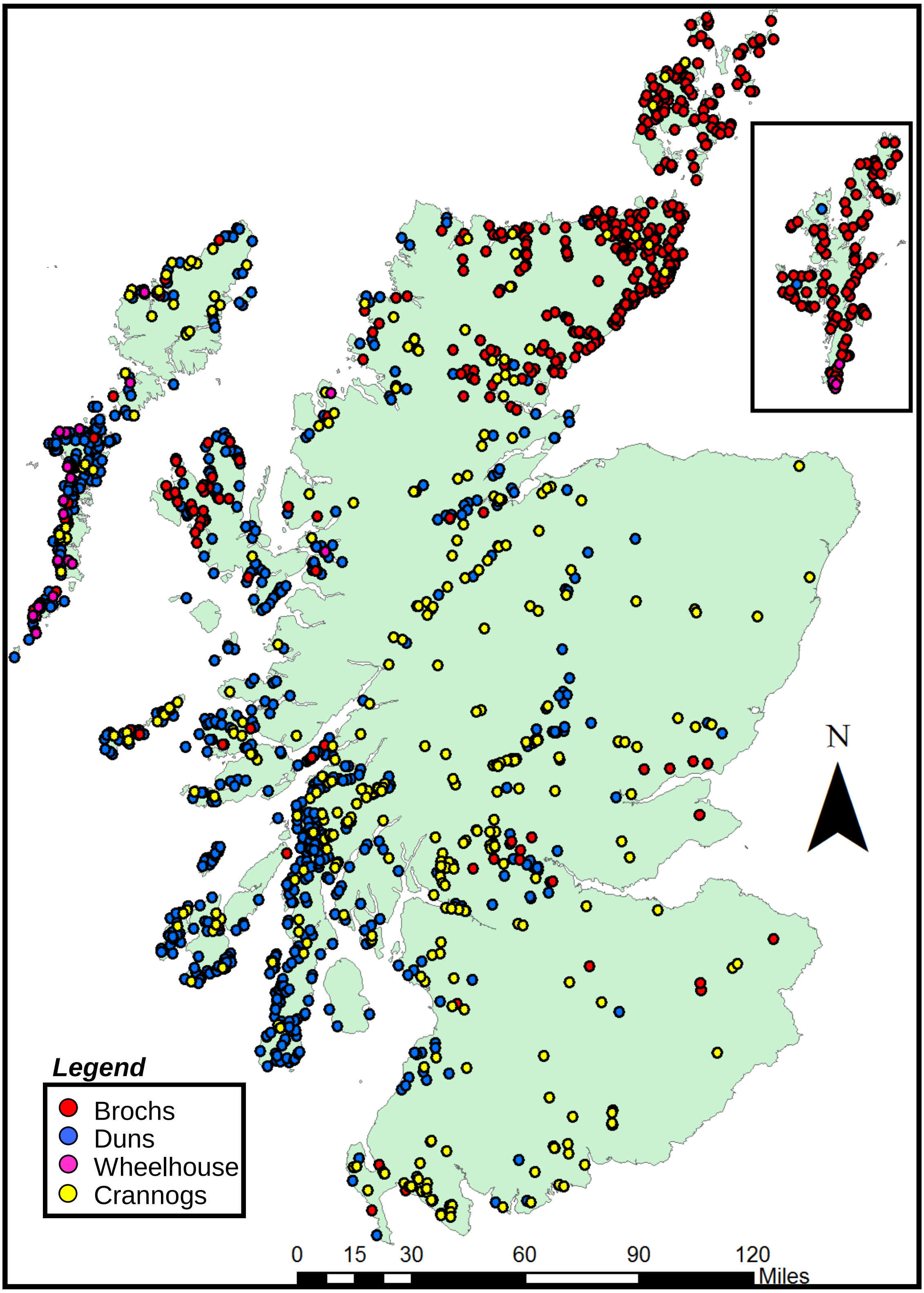

there are literally thousands of roundhouses across Scotland, hundreds of which have been excavated. This makes them an almost unparalleled resource for prehistoric studies, with the wide scope of this data also presenting Iron Age archaeologists with significant variation in relation to architectural form and material culture. Indeed, roundhouses here shift significantly in size throughout the Iron Age, varying from less than 7m to almost 20m in diameter, although ‘modest’ proportions (e.g. 8m across) appear most commonly (Harding 2009: 275). The extensive range of roundhouse forms (and their architectural features) is equally diverse (Figure 2.2), and includes architectural categories such as the ‘broch’, ‘wheelhouse’, and ‘dun’ (not to mention their subcategories: i.e. island dun; aisled roundhouse; solid-based broch; galleried broch; semi-broch); each of which is defined by their size, architecture and to a large extent, their geographical location (each is described in the review below).

Such variation in roundhouse building style, shape, size, location and material culture has meant regional studies have flourished in Scotland, and have alluded to three potential ‘cultural areas’ within the Atlantic zone: the Northern Mainland and Isles (Orkney and Shetland), Argyll and the Inner Isles, and the Western Isles and Skye (Henderson 2007: 150; cf. Cunliffe 2005: 73-75); each of which presents differences in material culture and architecture. Indeed, even within smaller geographical areas, distinctions in roundhouse form and material culture occur.

However, though distinct regional identities seem to have existed (and they probably did), there are few obvious boundaries to site distributions, and there seems to be much transgression (Haselgrove et al*.* 2001: 23); suggesting that certain site classifications (e.g. duns) are defunct and unnecessary. In turn, this has contributed to a somewhat confused picture of the Atlantic Scottish Iron Age; creating in its wake, a web of tangled interpretations, and inspiring a long and complex tradition of debate and dissent, of which, this review aims to clarify. And on that note, I shall now examine the history of Iron Age research in Scotland, beginning by looking at early antiquarian excavations, before analysing the different forms of settlement type, and asking how and where we may move forward with regards to the study of light.

The First Surveys

With its intense clustering of Iron Age sites, antiquarian investigations in the first decades of the 19th century began in the Orkney Islands, on a type of Iron Age roundhouse known as a 'broch'; a word deriving from the Norse 'borg' (meaning 'fort'). Found most numerously in the Northern Mainland and Isles, but also occurring in the West and the Western Isles (see Figure 2.2); these thick-walled, circular 'towers' are among the best preserved prehistoric buildings in Europe, and are perhaps the most impressive innovations of the Scottish Iron Age. It is thus unsurprising that early archaeological research focussed on these structures in particular, with Howe of Hoxa 'burgh' upon South Ronaldsay, being one of the first to be excavated, by Petrie in 1848. This was quickly followed by excavations at Jarlshof, (Bruce 1907), Mousa and Clickimin in Shetland (Dryden 1890; cf. Patterson 1922), and the East Broch of Burray in Orkney (Farrer 1859).

Also during this time, Thomas (1852; 1867; 1890) began to record the drystone roundhouse structures (including the brochs) of Orkney and the Outer Hebrides, and through the pioneering work of these early antiquarians, a definition of a 'typical' broch began to emerge: i.e. a drystone hollow-walled building possessing a range of specific structural devices (e.g. intra-mural galleries, wall voids, scarcement ledges) to create a stable dry-stone tower while retaining the basic roundhouse form (also see: MacKie 1965a; Figure 2.3).

Most contemporary observers had simply noted the existence of these 'typical' features, but Thomas realised that they were actually a clever technique devised to build a high, drystone, hollow wall (Thomas 1890) – the fundamental constituent of broch architecture. Thomas, whose work branched out into the Western Isles, also drew comparisons between the Outer Hebridean brochs and those of the Northern Isles, distinguishing brochs which had solid bases with those which had a hollow gallery at the base; alluding to regional designs.

In 1870, Petrie's excavations at Lingro also provided the first clear evidence for the presence of external buildings (interpreted as contemporary 'villages'[2]) around specific brochs; akin to those later found at Howe, Gurness, and Midhowe on Orkney, and Crosskirk, Nybster and Keiss Road in Caithness (for

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[2] Most broch 'villages' are now thought to be later additions however; for information on the broch 'village' at Gurness, see: MacKie (1994; 1998: 22-23); for the 'village' at Howe, see: Ballin Smith (1994) and MacKie (1998: 23-24).

more on broch villages, see: Armit 2003: 97-98; 2006: 254; Dockrill, Outram and Batt 2006; Foster 1989a; 1989b). This was followed by the first indications of stratified floor levels within brochs which were reported by Traill (1890) at

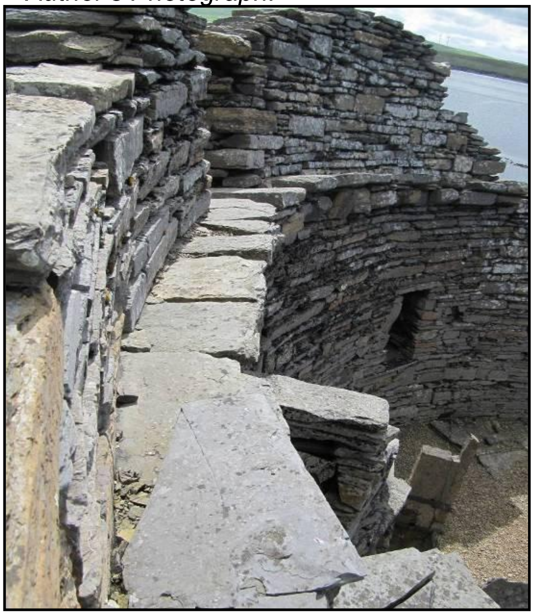
Figure 2.3. Typical Features of Broch Architecture.

Wall Voids. Mousa, Shetland.
Author's Photograph.

Double-Walling. Dun Troddan, Glenelg.
Author's Photograph.

Intra-Mural Staircases. Midhowe, Orkney.
Author's Photograph.

Scarcement Ledges. Midhowe, Orkney.
Author's Photograph.



Burrain, Orkney, in which Traill also provided thoughts on the dating of the brochs. The bronze and iron tools that were found in Burrian clearly demonstrated, he thought, that a theory recently advanced by Samuel Laing

(1867) – that broch origins lay in the Stone Age – was wrong, and that the structures were much more modern.

From these early studies, a mass of data was formed from which interpretation could finally begin, and the establishment of the Three Age system by Thomsen (1848) gave archaeologists a new perception of the prehistoric past, enabling a systematic approach of the archaeological material being presented. It was during this time, in the mid-19th century, that many eminent archaeologists in Scotland also came to the conclusion that the brochs were more a native Scottish/Pictish phenomenon, rather than the remains of intrusive Viking fortifications (a popular idea at the time; see Wilson 1851; cf. Simpson 1963). Indeed, during the 1870s, the outer hyper-diffusionist explanation – that the brochs originated in Scandinavia – was put forward by Fergusson (1877), and at once, there was a detailed response from Joseph Anderson (1878). Anderson later dismissed another assertion that brochs were of Pictish origin; devoting two chapters to their architecture, material culture and dating and suggesting that they were indicative of forts of an agricultural population of an earlier, 'Celtic' origin (1883). The results of Anderson's later work at the brochs of Yarhouse and Brounaban in Caithness (Anderson 1890), formed the first body of accurate data gathered from the Northern Mainland, with an appendix listing all known brochs in Scotland at the time, noting around 370 overall.

These publications mark the peak of antiquarian Scottish archaeology (Graham 1976), and though contemporary attitudes to 19th century antiquarianism are often disapproving (Baines 2002: 1), the vast amount of data and survey carried out during this period was nevertheless essential in categorising the various Iron Age sites of the region.

With the formation of the Royal Commission on the Ancient and Historical Monuments in 1909, accurate reports on sites in Caithness and Sutherland appeared soon afterwards (RCAHMS 1911a; 1911b), and these surveys, largely carried out by Alexander Curle, marked the beginning of a fundamental change in archaeological method in Scotland. Notably, Curle (1927) distinguished the architecture of brochs from the simpler 'dun' constructions found most numerously in the west – often regarded as 'simple' drystone walled enclosures without the architectural complexity of the brochs (Alcock and Alcock 1987; Barrett 1981; Nieke 1983; 1984; 1990: 135). Curle (1927) also noted that the brochs were developed regionally, dismissing a widely held idea that they were related to the nuraghi towers of Bronze Age Sardinia (MacKie 2002a: 35), and explaining confidently that brochs were indeed of Iron Age date, but that they often had long periods of occupation dating well into 1st millennium AD.

Foreign Influence or Local Development?

Both Anderson (1883) and Curle (1927) tended to consider brochs as a uniquely Scottish phenomenon with few clear links abroad, and this outlook prevailed until Childe, when successive generations of archaeologists increasingly came to see these structures as the result of movement or diffusion of ideas from outside Scotland.

Childe (1935) took a wide view, setting the brochs in a North-West European context; envisioning them as the manifestation of a large population movement into Scotland towards the end of the Iron Age. Suggesting that brochs were the transplanted strongholds of an invading elite, Childe later augmented his ideas (1940; 1946), explaining that broch culture was the result of immigration from South-West England. For example, the excavation of the blockhouse 'fort' at Ness of Burgi (Mowbray 1936) was explicitly conceived of as an attempt to identify the bridgehead on which the invading Celtic tribesmen settled prior to annexing and building their broch at Jarlshof. Similarly, Piggott (1966) attempted to demonstrate through three lines of evidence – decorated metalwork, evidence for horses and chariots and the appearance of forts – that a warrior 'Celtic' aristocracy from Western France had moved into Scotland, probably in the 1st century BC in response to disturbing influences further south.

Although at the time there was a broad consensus over the intrusive origin of brochs with regards to foreign influences, there was, however, much disagreement concerning their original form and function, largely due to the lack of excavation, and this is something that still exists today. Scott (1947) argued that the study of brochs had been weighted towards the best preserved sites, and, like Anderson before him, noted a clear link between the siting of brochs and good agricultural land. This relationship was so close, he felt, that the brochs must themselves have been farms.

Arguing that the vast majority of brochs survived as low, squat ruins with no evidence of tower like proportions, Scott (1947) also concluded that most of them were low walled farmsteads rather than high walled forts, like the broch of

Mousa. This idea was a radical break from conventional thought and was ahead of its time in tackling the problem of the social function of the brochs and duns by getting away from the concept of aristocratic castle and moving towards that of Iron Age farm.

Shortly after, Graham (1949) drew together all the available facts relating to the structure and variation of brochs across the whole of Scotland and tried to decide how normal the various architectural features were, how they were distributed geographically and so on, only to draw the most cautious of conclusions. However, with this collection of evidence, Hamilton carried out the excavation at the broch/wheelhouse complex of Jarlshof, Shetland. Influenced by Mortimer Wheeler's work in England, the publication of Jarlshof's excavation (Hamilton 1956) showed for the first time on a large scale, accurate plans along with carefully drawn, detailed sections; the separate layers of the site were disentangled and described and the objects found in them identified, listed and illustrated.

Hamilton's work at Jarlshof can also be seen as part of a growing appreciation of the 'wheelhouse' – another form of the Scottish Iron Age roundhouse tradition – and was preceded by the excavations on wheelhouses in 1951 by Lethbrodge at Kilpheder, by Scott at the Allasdale on Barra in 1951-2, by Young (1953) at A'Ceardach Mhor, West Geirinish (Young and Richardson 1960), by Fairhurst in 1956 at A'Ceardach Bheag, Drimore (Fairhurst 1971), and by Atkinson at Sollas in 1957 (Campbell 1991). These excavations helped define the wheelhouse as a distinct form of Iron Age settlement. To briefly describe this type of site here, wheelhouses (which seem to succeed the broch as a type of site) generally date to the Late Iron Age[3], and, though there are only *circa.* 50 known examples, they exist most numerously in the Western Isles (refer to Figure 2.2), where they seem to have represented an established form of non-broch settlement. However, possessing regionally distinct designs (Harding 2009: 112-114) – and thus, in reality, defying any singular classification – they can also be found on the coast of the North Mainland (Sutherland and Caithness), on Shetland (as at Jarlshof), and perhaps also on Orkney; as is suggested by the existence of buildings with radial partitions (e.g. at Howmae) (Harding 2006:

[3] Some wheelhouses, however, seem to have been used into the Early Historic Period, as at the wheelhouse at Old Scatness in Shetland, whose use extended into the second half of the 1st millennium AD (Dockrill 2003; Dockrill et al. 2010).

74; Henderson 2007: 160). Appearing to represent a form of domestic architecture (Armit 1988; Sharples 1998: 208), excavations have shown that most wheelhouses were set within sand-hills and are thus generally regarded as semi-subterranean structures (Beveridge and Callander 1931); though exceptions to the sunken floor technique do exist and include Allasdale on Barra (Young 1953) and Clettraval on North Uist (Scott 1948).

Figure 2.4. Examples of Wheelhouse Architecture.

Old Scatness Reconstructed Wheelhouse, Shetland. *Author's Photograph.*

Jarlshof Wheelhouse, Shetland. *Author's Photograph.*

For most, however, with only a central thatched conical roof presumably showing above the ground (Armit 1996: 136-143), they would have appeared unimposing to those outside. But once inside, they would have been towering and monumental, as one can witness at Jarlshof and Old Scatness in Shetland (Figure 2.4). Inside, wheelhouses generally possessed a curve of drystone walking and a series of spoke-like radial piers which supported a partially corbelled roof around the periphery of the house (Crawford 2002: 111; Parker Pearson and Sharples 1999a: 3). These piers, or ‘spokes’, are the most striking and diagnostic of wheelhouse attributes (Armit 1992), and permit much of the interior to be separated into a series of ‘bays’. Though this may have held a social function, the use of pillars also implies that the builders wished to create a curved colonnade – or an aisle – around the interior space, and especially around the central hearth.

Hamilton’s excavation at Jarlshof, with its broch and two adjacent wheelhouses, was particularly important in understanding the nature of the wheelhouse, especially in regards to its relationship with the broch. Indeed, Hamilton fixed the place of these structures in the long history of the site’s occupation, and showed that the sophisticated wheelhouses here were constructed subsequent to Jarlshof’s broch; suggesting that the wheelhouse followed the broch as a type of Iron Age structure. However, though Hamilton’s work here, and at Clickimin, suggested that some brochs were incorporated and restructured into ‘wheelhouses’, he still saw brochs as military structures with their origins in the Alpine area around 800-500 BC, and whilst excavating Clickimin broch in Shetland (Hamilton 1963), he repeated and elaborated these views (1957; 1962; 1965; 1966).

It was Hamilton’s diffusionist beliefs with regards to the brochs which influenced Euan Mackie, and from the 1960’s onwards, the latter dominated the field with his diffusionist viewpoints which he illustrated in a range of excavations, including Dun Mor Vaul, Tiree (MacKie 1974) and the broch at Leckie, Stirlingshire, between 1970 and 1978 (MacKie 2002a: 41). Strongly focussing on the details of broch origins, as well as their architectural features and development (MacKie 1965a; 1965b) – with his meticulous reclassification of brochs (i.e. only those displaying intra-mural galleries, wall voids, scarcement ledges; MacKie 1965a; 1965b) lowering the number of accepted brochs from nearly 500 to 104[4] - MacKie came to the conclusion that although the mass of the population was local, a small number of influential people came north to Scotland at various stages. Indeed, in MacKie's early view (1969a; 1971), southern migrants had introduced a range of cultural innovations during the first century BC and were prime movers in the development of the brochs. MacKie also concluded that the earliest brochs were to be found in the Hebrides whence they spread northwards to Orkney and Shetland; a view which was in contrast to the more generally held belief, originally voiced by Curle (1927), that they had originated in the north of Scotland.

Seeking to demonstrate an alternative sequence of development on the west coast however, and through a combination of site examination and selective excavation, MacKie (1969a; 2008: 267) advanced the idea that the ground-galleried brochs found most commonly in the Hebrides had developed from an earlier type of structure known as the 'semi-broch'; a small group of non-circular sites possessing all the specialized hollow-walled architectural features of the broch but are not free-standing towers. Excavating two 'semi-brochs' – Dun Ardtreck, Skye (MacKie 2002b) and Dun an Ruigh Ruaidh, Ross and Cromarty (MacKie 1980) – he was able obtain a number of radiocarbon dates that suggested to him that these structures were earlier than the mid-first century BC.

However, from the 1970s onwards, archaeologists were increasingly recognising that human societies operated in a rather more complex way than had previously been thought and subtler models were preferred, with trade, exchange and various forms of social interaction becoming the favoured explanations for the spread of ideas in prehistory; particularly as radiocarbon

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[4] Due to this strict definition, however, any broch that does not survive to sufficient height to display such features, or those which has not been excavated sufficiently to reveal those features, have either been overlooked or have been placed within a different class of site. Indeed, though some brochs survive to an impressive height, such as Mousa in Shetland (13.3m); Dun Carloway in Lewis (9.2m); Dun Troddan and Dun Telve on the mainland opposite Skye (7.6 and 10m), and Dun Dornaigil in Sutherland (6.7m) (Armit 2003: 55), few actually survive to a height which would allow many broch 'traits' to become known in the first place.

dating began to show that ideas thought to have diffused from the classical world or near east were, in fact, entirely home-grown. Indeed, by the early 1970s, Clarke (1970; 1971) had begun to systematically demonstrate the weaknesses of the diffusionist approach. Similarities between objects such as bone dice and pottery from Wessex and Scotland were shown to be unconvincing evidence for direct connections.

The idea of brochs as local innovations thus came back to the fore, and were particularly influential when Hedges, and others, excavated Bu (Hedges 1987a) – an isolated roundhouse – and the multi-phase broch 'village' of Howe (Hedges 1983), both in Orkney. The radiocarbon dates proved that Bu was not built by incomers from the south during the first century BC, but was built many centuries earlier, between 800-400 BC (Bell and Hedges 1980; Hedges 1987a). The clear dating to the Early Iron Age thus introduced the idea that early forms of broch – i.e. broch 'prototypes' – began to be built long before the first century BC (Armit 2003: 42).

Earlier evidence for the construction of thick-walled drystone roundhouses also began to emerge at sites in Orkney such as Pierowall (Sharples 1984); Quanterness (Renfrew 1979: 194); St Boniface (Lowe 1998); Tofts Ness (Ambers, Bond, Dockrill, Miles and Simpson 1994); Old Scatness in Shetland (Batt, Dockrill and Outram 2007) and Cnoc Stanger in Caithness (Mercer 1996). Dating between *circa* 800-400 BC, these sites represent a clear departure in terms of scale and external appearance from the stone-built forms of the Late Bronze Age, and supported a northern broch origin (although more fieldwork still needs to be carried out to support this). The lack of simple 'broch prototypes' (e.g. Bu in Orkney) in the Western Isles suggests that the broch form, complete with complex architectural devices, was adopted as a fully formed architectural package by communities in the Western Isles after it had developed elsewhere, probably in Northern Scotland.

Accompanied with MacKie's later reassessments of Clickimin broch (2002a) and his study of Shetland's material culture (2005), the origins of broch architecture seems to have moved back to the Northern Isles. Indeed, rather than being seen as a short lived product of an intrusive population, the fully formed complex broch roundhouses – exemplified by well-preserved sites such as Mousa in Shetland, and generally dating to the Middle Scottish Iron Age, between 200 BC and AD 100-200 (Henderson 2007: 157)[5] – are now believed to be at one end of a spectrum of a complex roundhouse tradition; developed locally over more than half a millennium, from earlier and less complex (but still massive) stone roundhouse.

However, the difference in architectural traits between simple 'prototype' brochs and complex, roundhouse broch towers not only suggested that the term 'broch' – as a single category – was defunct, but that the picture of Iron Age Scotland was far more fluid than had originally been conceived.

Architectural Typologies and 'Framing' Iron Age Society

In line with Scott's (1947) earlier work arguing that most brochs were originally low structures, Hedges (1987b) suggested that the walls of Crosskirk (Caithness) and Howe (Orkney) were so poorly constructed that they could never have been tower-like, as at Mousa. Following this, Armit (1990a; 1990b; 1990c; 1990d) and Fojut (1982a) suggested that although some brochs were towers, many were originally considerably lower in elevation and constituted large roundhouses or 'duns', such as those found in the west of Scotland. Accompanied by MacKie's extensive research in the Western Isles, there began in earnest a reassessment of the dun structures of the west from the late 1970s onwards.

Representing hundreds of drystone sites in Argyll, the Inner and Western Isles and elsewhere (refer to Figure 2.2), that supposedly do not possess the full range of architectural devices required to qualify as brochs or wheelhouses, the Argyll inventories of the Royal Commission originally classified a dun in 1971 as:

> 'a comparatively small defensive structure with a disproportionately thick dry stone wall, usually but not always sub circular or oval on plan, and enclosing an area not exceeding about 375 sq.m

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[5] Earlier examples of complex brochs do exist however (e.g. Old Scatness, Shetland); with many also continuing to be inhabited and reconstructed, as at Howe in Orkney (Baines 1999: 80; Ballin Smith 1994) and Jarlshof in Shetland (Bruce 1907; Hamilton 1956).

(4000sq.ft.); it would thus normally hold only a single family group' (RCAHMS 1971: 18).

However, the apparent simplicity of many duns was the result of a lack of excavation, and indeed, during the 1970s, 80s and early 90s, it was found that the duns were actually a very heterogeneous set of monuments, with a variety of ground plans. Indeed, Alcock and Alcock (1987), Harding (1984), Maxwell (1976) and Nieke (1990: 136) all argued that two distinct types occurred. The first were defined as small duns, characterised by small, circular, and potentially roofed dwellings; many of which shared the same architectural characteristics as brochs (e.g. galleries, cells and stairs), but have continued to be regarded as 'duns' to retain some form of regionalism. The second type are the larger, almost certainly unroofed 'dun enclosures', which may have protected smaller dwellings and are more akin to the later Irish ringforts (Henderson 2000: 123; 2007: 166; cf. Halliday and Ralston 2010). Other classifications of dun have also appeared in the literature, and include the 'aisled roundhouses', which are similar to wheelhouses; 'galleried duns', which share features with brochs; and 'defended enclosures' or 'promontory forts' (see Halliday and Ralston 2010; Ralston 2006: 12; RCAHMS 1997; Scott 1947; Young 1961; summarised further in Armit 1996: 114-115). Another type, 'island duns', are essentially 'crannogs'[6]; one of the most common types of site in Scotland (Figures 2.2 and 2.5), referring to any wholly or partially artificial island

Figure 2.5. Reconstructed Crannog. Oakbank, Loch Tay. *Author's Photograph.*

[6] Like brochs and duns, crannogs also have a long history of discovery and excavation; see: Armit 1989; 1996: 43-54; Barber and Crone 1993; Blundell 1909; Campbell 1870: 465; Cavers 2003; 2006; Cavers and Henderson 2005; Crone 1991; Dixon 1981, 1982a; 1982b; 1989a; 1989b; 2004; Fairbairn 1937; Fraser 1917; Grigor 1863; 1864; Mackinlay 1860: 44; Mapleton 1870; Mitchell 1881: 303-315; Monteith 1937; Munro 1882; Piggott 1953; Redknap and Lane 1994; Renfrew 1973; Ritchie 1942; Scott 1960; Scott and Fairhurst 1961; Stuart 1868: 116; Wilde 1840.

within a body of water assumed to hold a domestic dwelling (Barber and Crone 1993: 520), and often dating to the later prehistoric period between 500 BC – AD 500 (Henderson 1998: 231).

The ‘dun’ thus acts as a catch-all term for all these different types of site, and therefore seems to be irrelevant; an issue which has been discussed in depth (cf. Alcock and Alcock 1987; Barrett 1981; Maxwell 1969; Nieke 1983; 1984; RCAHMS 1971; 1975; 1980; 1984; 1988a). Indeed, up until the 1990s, the continual refining of definitions (e.g. aisled roundhouses, island duns, etc), along with the on-going emphasis on architectural typologies seemed to contradict the purpose by blurring distinctions. In response, Armit suggested the terminology of broch and dun (and all their subcategories) to be abandoned and replaced by a universal classification referring to all drystone roundhouses in the north and west of Scotland – the Atlantic Roundhouse; a term which is then subdivided into ‘Simple’ (i.e. most of the duns; broch ‘prototypes’) and ‘Complex’ (i.e. fully formed brochs) roundhouse types (Armit 1992; revisited Armit 2005; cf. MacKie 1994; 1997a; 1998; 2002a; Mulville, Parker Pearson and Sharples 1996; Parker Pearson and Sharples 1997; 1999a; 1999b; Sharples 1998).

It is obvious, however, that the uncertainty with regards to Iron Age architectural typology is derived from the fact that few brochs and fewer duns have ever been excavated to their foundations, thereby demanding archaeologists discuss them with the limited evidence acquired from the beginning of broch and dun studies. Indeed, though Caithness and Sutherland hold some of the most impressive Iron Age sites in Scotland (e.g. Crosskirk; Nybster; Cairn Laith), few have been excavated (Hingley 1992: 12). Armit’s excavations on Lewis (cf. Armit 1990c; Armit and Harding 1990), and particularly his studies on North/South Uist and Barra (cf. Armit 2002), have begun to build a picture of a range of settlement sites in these islands however, but archaeological understanding of the west still remains largely incomplete and fragmentary.

Indeed, although work on the Argyll duns has suggested that they result from a phase of political centralization contemporary with the Roman conquest of Northern England and Southern Scotland (Armit 1990d; Fitzpatrick 1989; Foster 1989a) – and are largely regarded as an early to mid first Millennium AD phenomenon[7] – there has actually been comparably little excavation or research carried out in Invernesshire, Wester Ross, and Argyll, with the notable exception of the RCAHMS surveys in the last thirty years, and the work carried out at the later prehistoric site at Bernie (Invernesshire), by Hunter (2004). Together with the fact that the Iron Age is also a difficult period for radiocarbon dating, there has consequently been a major deficiency in the chronological definition of the different classes of site (Ballin Smith and Banks 2002: 219), and thus any statement archaeologists make regarding the status and social interrelationships of sites can often be mere guesswork. Indeed, the questions concerning regionality, the chronology and the contemporaneity of both brochs and duns depend largely with the environmental and artefactual evidence gathered through excavation, and so many more dates are required.

The lack of such evidence is important and means that contemporary archaeological research on Iron Age Scotland retains many of the major trends of the mid to late twentieth century; that being the persistent obsession with architectural typologies and structural definitions. However, in compensation, there has been a large re-focus on landscape and domestic space analysis since the 1980s (see Chapter Five and Six for landscape studies), both of which have been used to construct interesting social pictures of Iron Age Scottish society.

Regarding landscape research, MacKie's basic attempt in the early 1960s to analyse the topographical situation of brochs (MacKie 1965b) was followed up by Fojut (1982b) and Smith's (1985) work in Shetland. Fojut (1982b; cf. 2005a) carried out a geographical analysis of 75 Shetland brochs, proving that positions near the beach were preferred (see Chapter Six for a similar analysis; see also: Rennell 2008; 2010) and that each broch dominated a distinct estate of ground. Influenced by such studies; the recent research on Orkney and Shetland (Ballin Smith 1994; Bond 2003; Foster 1989a; 1989b; Hedges 1985; 1987a; 1987b; 1987c; 1990; MacKie 2002a; Phillips 2003; cf. Parker Pearson 2004) has focussed attention on the islands unique landscape whilst exploring the potential usage and function of the broch structures. These studies inspired further work in the Western Isles (cf. Armit 1988; 1990a; 1990b; 1990c; 1990d;

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[7] This is a date derived from the fact that many excavated examples possess Early Historic material in the form of imported pottery, beads, and metalwork (cf. Alcock and Alcock 1987; Nieke 1984; 1990).

1996; 2002; Cerón-Carrasco, Church and Thoms 2005; Harding 1997; Harding and Armit 1990; Lane 1988; 1990; Topping 1986; 1988; cf. Dockrill and Bond 2009), reflecting the availability of a large landscape with many sites.

Also, influenced by a range of studies which have examined the ways in which people, place and landscape intertwine (e.g. Bevan 1999; Chadwick 2004; Ingold 2000b), settlement studies in Atlantic Scotland have begun to move away from site-based analyses to contextualise sites through a greater theorised approach to landscape and the environs (e.g. Rennell 2008), while also highlighting the equal importance of waterscapes; from lochs and rivers, to maritime connections (see: Henderson 2007; O'Sullivan 2009; Rennell 2010), as to be explored in depth in Chapters Six and Seven.

But landscape has not been the only focus of recent years, and the possible use of space within Scottish roundhouses has also been examined in depth (e.g. Foster 1989a; 1989b; Romankiewicz 2011: 39-71). However, it is very difficult to interpret daily activities and practices for roundhouses. This is not just a consequence of the issues which relate to excavation, as noted above, but it is also a difficulty arising from the fact that such practices are tricky to attain from a constantly used, re-used and cleaned floor, which is more often than not truncated by later activity (e.g. Armit 2006: 240-241).

Despite this however, and in line with an ongoing movement away from detailed analysis and debate concerning architectural detail and typologies (cf. Armit 1997a; 1997b; Parker Pearson and Sharples 1997), the possible cosmological influences upon house construction, spatial use and orientation in Southern Britain (e.g. Boast and Evans 1986; Hill 1993; 1995a; 1995b; Oswald 1991; 1997; Wait 1985; also see: Davis 2013) inspired similar approaches in Scottish Iron Age studies; many of which have focussed particularly on the role of doorway orientation (e.g. Foster 1989a; 1989b; Ingram, Marshall, Mulville and Parker Pearson 1999; Parker Pearson 1999a; Parker Pearson and Sharples 1999a; 1999b). However, though suggestive of a move away from purely processual methods, such approaches to house space (in both Southern Britain and in Scotland), have been countered in recent years, especially with regards to the cosmological significance ascribed to doorway orientation (e.g. Pope 2007; Romankiewicz 2011: 54-57; Webley 2007; Woodward and Hughes 2007; cf. MacKie 2010: 104-105).

As noted in the introduction, these criticisms have worked to make cosmological approaches somewhat redundant in Scotland, and indeed, they have seemed to erase debate on the issue; dismissing ritualistic, and to a large extent, even subjective interpretations of the record, and replacing such approaches with simple and seemingly universal practicality, while also supporting the idea of a purely descriptive archaeology. I believe, however, that this kind of thinking is in danger of narrowing our vision, and I would further contend that it is potentially representative of Hill's (1989: 17) 'familiar Iron Age', in which archaeologists have become too focussed on aspects which are most familiar to them – i.e. structural typologies and environmental concerns. This seems especially true with regards to understanding light, and indeed, those advocating and critiquing the cosmological model (and its association with doorway orientation) seem to hold the assumption that light is merely a practical necessity rather than a polysemic social tool.

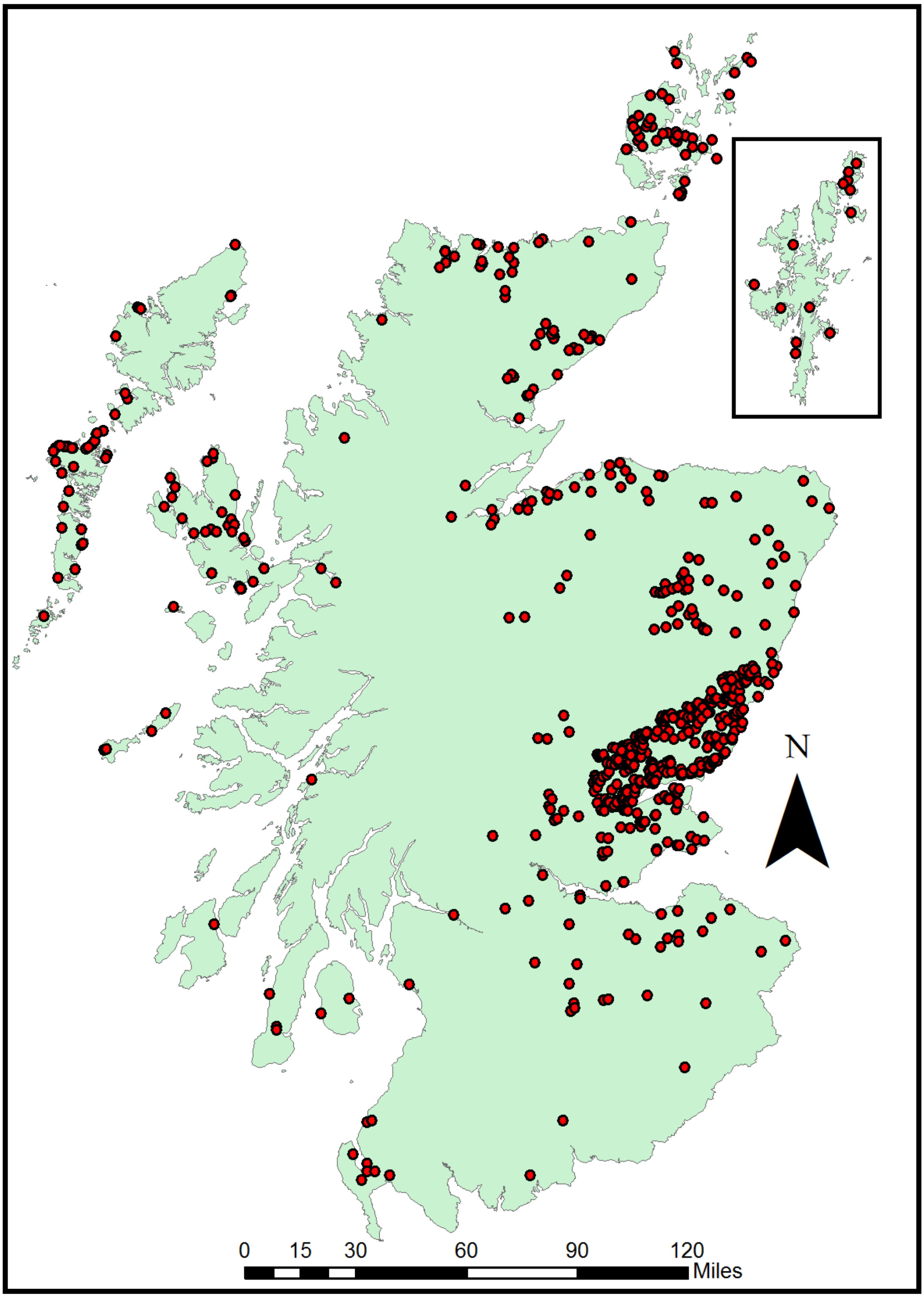
That being said, there are a variety of other sites which are distinctly 'unfamiliar' in Scotland, as the report compiled by the Scottish Archaeological Research Framework has recently demonstrated (ScARF 2012); sites which have the potential to challenge our assumptions with regards to the role of light in the past, and which therefore deserve attention here.

Branching Out: Examining 'Other' Sites in Atlantic Scotland

Research in Scotland has not wholly been restricted to the study of the 'Atlantic Roundhouses' in the last twenty years. Indeed, recently, a variety of other, non-circular (but probably still 'domestic') sites have inspired archaeologists to think in new ways about society during this period. For example, rectangular constructions of four or more posts have often been found on crop-mark sites in Scotland, and, though generally interpreted to be Iron Age granaries, the nature of these structures still remains highly debateable (see: Dunwell 2007: 61-62). Other sites in the Atlantic zone have been noted to be D-shaped 'semi-brochs' (as noted above), a concept strongly supported by MacKie (1991; 2008: 267, 274-275), but rejected by others, who argue that they are simply eroded or collapsed roundhouses (Harding 1984). Furthermore, emerging during the Late Scottish Iron Age, constructions which were predominantly cellular in nature have also been discovered, usually within existing roundhouse shells, as at the Howe, Orkney (Ballin Smith 1994); Gurness, Orkney (Hedges 1987c); Old

Scattness, Shetland (Dockrill 2003); Scalloway, Shetland (Sharples 1998); and the Udal, North Uist (Selkirk 1996). There are also a small but significant proportion of rectilinear structures too, such as the 'wags' (stalled buildings) (see: Baines 1999; Cowley 1999; Curle 1944; 1948); the function of which is yet to be satisfactorily resolved.

Figure 2.6. Distribution of Souterrains across Scotland.



However, aside from these ‘possible’ domestic structures, there is also a range of other sites which are increasingly being ascribed a non-domestic and/or ritualistic function; sites which have the potential to provide us with a better understanding of both light and the nature of society in Iron Age Scotland. With regards to the study of light especially, the *circa* 600 Scottish souterrains (also known as ‘Earth Houses’) – which, as their name suggests, represent subterranean, or partially subterranean, chambers or passages (usually underneath roundhouses) – are of particular interest, and are often argued to have had a composite ritual and storage function (Henderson 2007a: 142-147).

Varying in date from the Late Bronze Age/Early Iron Age in the Northern Isles to the Roman Iron Age south of the Forth, with a presumed floruit in the last centuries BC and the first two centuries AD (Armit 1999; Miket 2002), they possess a wide distribution in Atlantic Scotland (Figure 2.6), and are found on the Inner Isles, the Western Hebrides, Sutherland, Caithness, the Northern Isles (especially Orkney), Ross and Cromarty, Lothian and the Borders (see Miket 2002: 78; Welfare 1984; cf. Jobey 1975)[8]. Though generally sharing the same architectural forms as souterrains found within Cornwall (Christie 1978; 1979; Cooke 1993; May 1996; MacGregor 2004; Startin 1981), Brittany (Harding 2004: 198), and Ireland (Thomas 1972; Warner 1979; 1980; 1986), there is, in fact, considerable regional variation in terms of size, design and form within Scotland alone (Miket 2002: 79; Wainwright 1953; 1963; Welfare 1984). In Angus, for example, substantial curved and paved souterrains exist which can run for up to 40m, where those of Sutherland and Aberdeenshire are significantly smaller. The galleries of Shetland and Orcadian souterrains, on the other hand, regularly lead to a small chamber (as at Rennibister and Grain), which, if not for their interior pillars, are very reminiscent of the Neolithic chambers also seen on these islands; suggestive, perhaps, of a copying of these earlier constructions (see Figure 2.7).

They may thus allude to the possible value ascribed to other subterranean spaces in Scotland, such as those found within the inherited landscape (e.g. Neolithic mortuary structures; see: Hingley 1996; 2005; cf. Davies and Robb 2004; O’Brien 2002; 2003: 63). Indeed, at Howe in Orkney, the fact that a roundhouse (and broch) was situated directly over an earlier Neolithic building

[8] Many, if not the majority, of Scottish souterrains have been found outside the Atlantic Zone however, on the eastern side of Scotland, especially Grampian, Tayside, and Fife.

(Ballin Smith 1994) – with the original Neolithic entrance passage being reformed into a souterrain-like structure beneath the broch – certainly suggests

Figure 2.7. The Chamber within Rennibister Souterrain, Orkney.
Author's Photograph.

a connection between souterrains and Neolithic constructions.

Similarly, the Iron Age use of subterranean features in the natural landscape, such as caves, are also increasingly being examined by archaeologists (see: Armit and Schulting 2007; Armit, Schulting, Knüsel and Shepherd 2011; Benton 1931; Layard 1934; Saville and Hallén 1994; Shepherd and Shepherd 1995; Sligo 1857; cf. Branigan 1997; Branigan and Dearne 1991; 1992; Budd and Taylor 1995). The individual deposits and burials recently discovered at High Pasture Cave in Skye is a particularly interesting example (see: Birch 2004; Birch and Wildgoose 2010), and it has certainly given credence to the idea that subterranean spaces and landscape foci were significant in the Scottish Iron Age.

The use, construction and possible veneration of underground spaces is even further highlighted, however, in a variety of other unique subterranean structures which, considering their relationship with light and dark, provide important case studies in the latter stages of this thesis (especially Chapter Seven). For example, the newly discovered Iron Age site of Knowe o' Skea on Westray (Moore and Wilson 2000; 2005; 2009) is particularly interesting.

Defined as a semi-subterranean 'funerary complex', with well over 100 burials already uncovered (about 60% of which were children or neonates), this Iron Age 'cemetery' ran from between 200 BC – AD 400 (G. Wilson, personal communication, January 16, 2013), and was thus contemporary with many Orcadian brochs.

Similarly, the non-domestic Iron Age metalworking complex at Mine Howe on Orkney (Card and Downes 2002) – with its distinctly impractical subterranean 'well' – alludes to a possible belief in an 'Underworld' while also supporting the idea of an Iron Age cult of water existing here; an argument further strengthened not only by the fact that many domestic sites are located in water bodies throughout Scotland (i.e. island duns/brochs, crannogs), but also in the increasing evidence for Iron Age ritual deposition of objects in water bodies across both Scotland (Aldhouse Green 2004: 95; Green 1986: 146; cf. Christison 1881) and Southern Britain (Bradley 1990b; Coles 1990; Fitzpatrick 1984; 2005: 161; Warner 1991).

Overall then, these unique, 'other' structures of the Scottish Iron Age help to demonstrate the complexity and individuality of its Iron Age communities. But they also have the potential to answer questions in relation to the influence of light and dark too; a theme which has hitherto been either ignored or largely neglected in those studies which have solely examined the Atlantic Roundhouses. The question that needs to be addressed now however is where do we go from here?

Themes to Explore: Aims and Objectives

Atlantic Scotland has a long tradition of research which stretches back to the early 19th century. This makes it an extremely data-rich period, and though many themes still need to be explored in greater depth – from regional chronologies and settlement sequences, to more innovative approaches relating to concepts such as landscape and society (for more details, see: ScARF 2012) – a broader vision of Scottish Iron Age society is developing. Indeed, in the last few decades, it has become ever clearer that the relationship between Iron Age communities, their settlements and the landscape, is much more complex and intertwined than had been previously been assumed.

In recognising this move towards more holistic approaches, I would contend that the study of light must likewise extend beyond the confines of orientation research (which it has thus far been restricted to). Indeed, rather than assuming light to be a mere practical necessity, I wish to explore how light helps to construct social spaces and moral orders (both within the domestic space and within the landscape). To conceptualise this objective, and in acknowledging the progress of Atlantic Scottish Iron Age studies as noted above, I shall develop upon the three foundational questions as set out in the Introduction of the thesis and outline a series of aims which shall seek to answer them.

Foundational Questions

1) How do we move away from the polarized division of practical vs. symbolic models of Iron Age society in Scotland?
2) Apart from entrance orientation research, how can one examine light in the prehistoric past?
3) And how did the integral relationship between light and dark, and light and water, influence aspects of Iron Age Scottish society?

Aims and Objectives

- To define the role of lightscapes in the creation of social space in the Atlantic Scottish Age.
- Using anthropological and architectural approaches to the study of light, such as those taken by McQuire (2005), Strathern and Strathern (1971), and Tanizaki (1977), I aim to challenge purely practical approaches to prehistoric architectural studies, placing the study of Iron Age domestic space within a more holistic framework.
- To outline the practicality of the Iron Age broch in relation to its environment.
- To explore whether the cosmological model existed in some form.
- To explore the role of idiosyncrasy, especially in Orkney (Chapter Seven).
- To create an innovative archaeological methodology that records exterior lightscapes in time and space.
- To investigate how seasonal lightscapes change perceptions of landscape.

- To ask whether the differing lightscapes upon the landscape influenced the emplotment and orientation of sites.
- To explore the reasoning behind site emplotment in general; especially with regards to water (as a reflective, light-bearing element), light, and potential land-use.
- To use GIS methodologies (used in Chapters Five and Six) alongside more experiential approaches to the record (the case studies of Chapter Seven).
- To ask whether any regional orientation conformity was practically, celestially and/or landscape/seascape focused.
- To explore the potential association and metaphorical significance between light, landscapes and waterscapes.
- To examine the possible influence, impact and symbolism of light and dark within subterranean structures (e.g. Mine Howe), especially in Iron Age Orkney.
- To explore a possible belief system in an 'Underworld', and to ask how such a theme may have influenced conceptions of light, dark and water.

In order to tackle these, and as noted in the Introduction, this thesis splits into two popular avenues of exploration: domestic space analysis (Chapter Three – which examines the influence of the environment on the broch structure; and Chapter Four – which attempts to define the social nature of the broch 'home') and landscape/waterscapes (Chapter Five – which records exterior lightscapes in time and space; and Chapter Six – which examines the nature of waterscapes), with the final chapter (Seven) bringing multiple themes together to form a concise case-study of the idiosyncratic role of light and dark and their relationship to water and underground spaces in Iron Age Orcadian society.

As one may imagine, each one of these chapters differs markedly in relation to method of analysis and geographical scope. Therefore, before moving onto the next chapter, I think it important here to explain and justify the progress the thesis shall take; exploring its many methodologies and the nature and range of its datasets.

Moving Forward: Scope, Methodology and Justification

Domestic Space: Analysis on the Architecture of the Iron Age Home

Moving on from this chapter, the next – the third (‘The Practical Dwelling: The Vernacular Broch and the Iron Age Environment’) – is underpinned by the idea that before we can study the symbolic aspects of architecture and site emplotment, the apparent practical aspects of Iron Age structures, and particularly, the Complex Atlantic Roundhouses (i.e. the brochs), need to be examined. To place light in a broader picture of Iron Age life, this chapter analyses how the broch was adapted to its environment and the elements (including light) which affected it. This then allows us to begin to comprehend the ways in which light may have been manipulated and orchestrated along with other elements, such as water and wind.

A brief ethnography and structural analysis of blackhouses, and the ways in which light, water, wind and fire were manipulated within these structures is also included here and comparisons are given to suggest that practical purposes to both orientation and other architectural features are certainly possible. The primary dataset for this chapter includes doorway orientation data from 320 blackhouses and 242 brochs across Scotland, largely attained from Canmore within the Royal Commission on Ancient and Historical Monuments of Scotland database inventories.

In defining the characteristics of Iron Age brochs, it goes on to detail the problems with purely practical conclusions and suggests that other factors may now be taken into account, leading onto the next chapter (‘Chapter Four: The Holistic ‘Home’: The Broch as Castle, Temple, Calendar and Farm’).

Having examined the many practical aspects of Iron Age architecture, and particularly the brochs, Chapter Four begins by asking: ‘how do we define a ‘home’?’, and ‘what made the broch a ‘home’?’, focussing specifically on the issue of symbolism and ritual within the domestic space. It goes on to question whether elements of the cosmological model may have existed, and inspects the evidence and the debates which surround it.

Utilising doorway orientation data as noted above, this chapter does not just illustrate that certain elements of the model were possible within particular regions of Iron Age Scotland, but it also demonstrates the diversity and range of broch features (e.g. doorway orientation, site emplotment, and artefact deposition) throughout Scotland, revealing in the process a picture of intense regionality. The dataset for this analysis, compiled from various sources, is thus very large indeed, and includes structural data relating to the dimensions (e.g. diameter, wall thickness, wall base percentage and wall height) and features (i.e. mural cells, staircases, guard cells, wall voids, intra-mural galleries, scarcement ledges, outworks, door checks, blocks houses, outbuildings, aumbries) of over 1,270 Atlantic Roundhouses across Atlantic Scotland.

As any study on light also requires a comprehensive picture of the society in question, this chapter goes on to argue that the subtleties of light are difficult to distinguish in Iron Age Scotland as a whole due to the diversity of its regions. As a result of this, it judges that a narrower focus is required, and much of the remainder of the thesis reduces much of its geographical scope onto the Northern Isles (especially Orkney; the reasons for this are detaled below); an area with excellent site preservation and a comprehensive history of excavation.

Lightscapes: Analysis on Light

Representing the first of two landscape studies, Chapter Five ('Shadows in the Landscape: Lightscapes in Shetland and Orkney and their Impact on Broch Orientation and Location'), examines the element of light itself and attempts to integrate both a GIS approach to landscape with that of a more experiential, first-hand approach.

Detailing an innovative archaeological methodology which records exterior lightscapes in time and space – a methodology that measures light in the landscape using both GIS hill-shade tools and LiDAR data – this chapter examines over forty sites across Shetland and Orkney which are set within shadow or direct sunlight during differing periods of the day and year.

Moving on from the more generalised orientation analyses of Chapter Four, it examines this data in relation to site orientation to allow relevant questions to be answered regarding whether orientations were influenced by the need for daylight admission. In this way, it is possible to ask whether both practical (i.e. light availability, seasonality) and cosmological/symbolic concerns (the marking of solstices; references to landscape foci) were important for these communities. This study suggests a complex and idiosyncratic picture with regards to light availability in both Shetland and Orkney.

Of note here is the narrowing of the thesis' scope on Orkney and Shetland, where I also conducted two fieldtrips in June/July 2012 and in March 2014 to examine selected sites firsthand. There are several reasons why I chose to narrow the thesis on these areas in particular. Primarily, it is because in the northern latitudes of Shetland and Orkney, there remains a stark contrast between the available sunshine at midsummer and that of midwinter compared to the rest of Britain. Here, one can thus imagine that light within the Iron Age house would have been an invaluable commodity during the darker half of the year. Also, Orkney and Shetland possess some of the most well-preserved and best excavated Iron Age structures in Europe; with many of brochs here still retaining their original entrances – something which was imperative to the success of this study.

It is of note here that despite only analysing these two regions (with less than fifty sites between them), the dataset for this chapter was very large, and indeed, the hundreds of LiDAR lightscape-maps created from this particular analysis form the bulk of this thesis' data. Furthermore, with the added aid of viewshed analysis and firsthand observations, what this enormous dataset and its landscape analysis did point to was that the brochs in these areas were often in very close proximity to water (a light reflecting element in itself), often at the expense of good direct sunlight.

It is thus suggested that for these societies, good light and a close proximity to water may have been integral and intertwined with each other. For Scotland, the sometimes harsh climate of its northern latitudes certainly foregrounds particular stimuli above others, and though this is pertinent with regards to light (as explored throughout this particular chapter), it is also relevant with regards to water; an element which may have been central to the identity of Scotland's Iron Age communities, as it remains so for many today (Cohen 1987; Miller 1999; Waugh 1960), thereby requiring an analysis which moves away from the issue of light, and solely examines the proximity of sites in relation to water bodies across Scotland.

Waterscapes: Analysis on Water

In an attempt to justify the move away from light, Chapter Six (Water and the House: The Aquatic Iron Age of Atlantic Scotland), examines the relationship between light and water. Both elements are, of course, very different from one another; though ultimately, the relationship between them is clear. Being highly luminescent, water reflects light and scatters it, and so also acts as a shifting light source. Furthermore, the light bearing qualities of water also emphasise the fact that until relatively recently in human history, water was the only ‘mirror’ and provided the only opportunity to see a visual image of oneself, thereby allowing a person to witness themselves reflexively. For these reasons, water deserves significant attention within any study on light. The strong relationship between proximity to water and the need for good light in Orkney and Shetland, as noted in the analysis on light in Chapter Five, also suggests the need to investigate this relationship further.

The analysis of this chapter thus attempts to gauge the ways in which Scotland’s Iron Age communities (focusing specifically on those sites termed ‘Atlantic Roundhouses’) related to water in its many contexts, from the sea, to lochs, to streams. This analysis thus first and foremost examines water in its landscape context and analyses Iron Age proximity to different water bodies throughout the various regions of Atlantic Scotland, including (1) Shetland, (2) Orkney, (3) Caithness, (4) Sutherland, (5) the Western Isles and Skye, and (6) Argyll.

I did not visit all of these areas personally however, and so the data for many of these regions, as well from areas I visited, was acquired from other sources, including site reports, and site anthologies (e.g. Hedges 1987a; 1987b; 1987c; Romankiewicz 2011; Mackie 2002a). I also made use of data retrieved from Canmore within the Royal Commission on Ancient and Historical Monuments of Scotland database inventories. Regarding the maps used to measure the distance between ARs and their nearest water body, I used ‘Digimap Roam’, which enables one to view maps using Ordnance Survey data at one of 14 different pre-defined scales. In conjunction with these maps, I used measurement tools available within Digimap Roam – which allows distance to be measured on these maps – to measure the distance between all the known ARs (1,276 sites) and their nearest water source.

From this, it becomes clear that Iron Age communities in Orkney in particular had clear and strong associations with watery contexts, especially the sea, alluding to a distinctly maritime society here. It is noted that for many of the sites located in this area, the watery contexts which sites were positioned near would have had a great practical value. However, at the same time, the symbolism which water held for communities in Orkney may have also tied in with the meanings being attributed to light; thereby suggesting an integrated approach between light and water should be taken in the concluding chapters.

Integrated Interpretive Discussion and Conclusion

Progressing beyond the concerns of architectural typologies and the cosmological model as expressed in earlier chapters, the thesis then moves on to explore the personal and individual traits of Orkney's Iron Age communities (Chapter Seven. Appeasing the Waters: The Relationship between Water, Light and Darkness in Iron Age Orkney). This especially regards those brochs where there seems to have been a relationship between light (as explored in the analysis of light in Chapter Five), water (as explored in the analysis of water in Chapter Six) and a notion of an Underworld; all of which are dramatically manifest in the Orcadian landscape.

Utilising nautical charts acquired from the Maritime Digimap service, this analysis includes a review of dangerous Orcadian waterways and the locating of brochs near such locations. I then move on to discuss the significance of an Underworld metaphor in Orkney – a budding area in Iron Age Scottish studies – and note the prevalence of underground subterranean Iron Age structures found across these islands, focusing particularly on the role of light and colour, and the impact that orientation, stone type and water have on our experiences of these places. The significance and impact of light in the Orcadian landscape – a facet previously examined through the map-based study of Chapter Five – is widened and studied in phenomenological terms (as undertaken during fieldwork in Orkney); suggesting that there may have been a powerful relationship between bright and dark spaces in Orkney.

There is thus an attempt in this final chapter to move away from purely objective accounts of place – i.e. as something fixed, categorised, separate and easily definable – to understand Iron Age Orcadian society as much more fluid and open than is perhaps usually assumed. In this way also, the phenomenological approach taken here attempts to dismiss the practical vs. symbolic models of Scottish Iron Age society as noted in the review above, while also attempting to present a more integrated approach; countering the dispassionate gaze (Thomas 2004b: 199), and also countering our own assumptions on how light and water can work together to create atmosphere and meaning.

Chapter Three

The Practical Dwelling: The Vernacular Broch and the Iron Age Environment

To fully understand the role of light and grasp the impact of light upon life in Iron Age Atlantic Scotland, I would argue that one must begin by exploring that which seems most obvious, so as to provide us with a clearer picture which can then be built upon. I wish to start then by examining what one may assume to be the practical aspects of the domestic space; i.e. the factors of the 'house' which dealt with their surroundings. To comprehend how the domestic space was integrated and adapted to its environment, I wish to ask how it was constructed so as to maximise the benefits and minimise the disadvantages of its climate and surroundings: how were particular elements – i.e. water, wind, and especially light – dealt with and managed?

Once the domestic space has been set within its environment, I can move on to ask less obvious and more complex questions relating to the social context of the house; enquiring how the Iron Age 'home' may have acted as 'castle', 'temple', 'landmark' and/or 'symbol'. To begin this study then, I shall briefly explore the climate of the period.

The Iron Age Environment

The Iron Age (*circa* 800 BC to *circa* AD 500) climate, reflecting the very long-term, Milankovitch-driven millennial relationship between the Earth and the Sun, suggests summer temperatures in North-West Europe, including Scotland, to have been slightly warmer than today, and winter temperatures not dissimilar to today's (ScARF 2012: 13). However, the centennial-scale climatic fluctuations superimposed on these trends illustrate a different picture, and suggest that the Iron Age was a period of climatic decline. Indeed, at the end of the Bronze Age and beginning of the Iron Age (*circa* 850 BC), there was a dramatic change in climate, from warm and dry to cool and wet, throughout Northern Europe; a theme well-attested in the literature (Henderson 2007: 36; cf. Barber, Chambers and Maddy 2004). With increased storminess in Northern Britain after *circa* 500 BC being recognised in several case studies (Wilson, Orford, Knight, Braley and Wintle 2001; Wilson 2002; for Northern European evidence, see: de Jong, Hammarlund and Nesje 2009; cf. Bjorck and Clemmensen 2004; Gilbertson, Shwenninger, Kemp and Rhodes 1999; Lamb 1981: 55; Wilson, McGourty and Bateman 2004), climatic deterioration is also supported by pollen core evidence from sites in the Forth Valley (see: Davies 2006; Ellis 2000). Bond et al's. (1997) work on the existence of icebergs off the coast of Western Ireland (*circa* 800 BC) also attests to a hemispheric, and perhaps even global state of rapid climatic downturn (Mayewski et al. 2004; Chambers, Mauquoy, Brain, Blaauw and Daniell 2007), something which is further alluded to by Oppo, McManus and Cullen's (2003) research on the existence of cold, ice-bearing surface ocean water off Western Ireland between *circa* 1100 BC and *circa* 400 BC; the only time this occurred in the last *circa* 5,000 years.

Such changes are often argued to constrain or enable economic activity during periods of widespread social upheaval which assumedly occur as a result of that change (Pillatt 2012: 30; Peiser, Palmer and Bailey 1998; Sherratt 1997; Ryan and Pitman 2000; also see: Coombes and Barber 2005; Armit and Ralston 2003: 193), and we can assume that this dramatic change in climate had a profound social and economic impact upon Early Iron Age communities throughout Europe. Indeed, for Iron Age Scotland, as it became colder and wetter from around *circa* 600 BC onwards, peat and heather would have claimed agricultural land previously available during the Neolithic and Bronze Ages (Bell and Walker 1992: 72), and in response to the limited pockets of land available, one can imagine that control over land and other resources promoted territoriality.

It may seem unsurprising then that during this climatic downturn, the earliest thick-walled drystone roundhouses in Scotland begin to appear. Dating generally from between *circa* 800 to 400 BC, these include sites such as Pierowall (Sharples 1984), Bu (Bell and Hedges 1980; Hedges 1987a), Quanterness (Renfrew 1974; 1979: 194), St Boniface (Lowe 1998) and Tofts Ness (Dockrill 2007) in Orkney, and Cnoc Stanger (Mercer 1996) in Caithness. Clearly representing a move away from the stone-built forms of the Late Bronze Age in the north, their construction suggests a shift towards monumental domestic expression in Early Iron Age Scotland, something which may have been influenced by the change in climate. However, their plain walls – generally without intramural spaces and possessing only moderate internal diameters – means that these composite-walled roundhouses of the early first millennium BC have been described as 'Simple Atlantic Roundhouses' (Armit 1996: 115), and are regarded as advanced versions of Neolithic and Bronze Age composite house constructions (Romankiewicz 2009: 384).

These precede more complex stone roundhouse forms, however, which began to incorporate galleries and cells within their walls (features discussed below) and which began to be built in the north around *circa* 400 BC onwards (Armit 2003; Gilmour 2002). Examples of these include the fourth century BC galleried roundhouse in Langwell, Sutherland (Nisbet 1994), and the mid-first millennium BC site at Old Scatness, Shetland (Dockrill 2003), which possesses a staircase and at least one intramural cell. The appearance of fully formed complex roundhouse towers however (i.e. the brochs), such as we see at sites like Mousa in Shetland, and which may be considered as a high point in monumental expression in Iron Age Scotland, generally date to between 200 BC and AD 200 (Henderson 2007: 157), as noted in the previous chapter.

Implying an architectural evolution from simple and plain to elaborate and complex throughout the Iron Age, the development of these robust, fortified dwellings in Scotland suggests that Atlantic Roundhouses, in all their forms, were built as symbols of establishment, domination and territoriality in a period of climatic decline; perhaps even acting as symbols of human control over nature, as argued by Parker Pearson and Sharples (1999b: 364).

This sense of ‘establishment’ is not just suggested in their monumentality however, but is also often demonstrated in their positioning in the landscape. Indeed, although some Atlantic Roundhouses (such as some promontory forts, island duns and crannogs) are found in highly isolated locations and are separated from good agricultural land (though it should be remembered that many of these landscapes have been overrun by peat since the Iron Age), many others were located within agricultural landscapes, and either overlooked or were embedded within these resources. This suggests that access to and control of agricultural land was of great importance, and this may have been linked with status in many communities (e.g. Dockrill 2002).

Agriculture was not always the prime focus however, and many other roundhouses overlooked important sea routes, implying a control over access, with examples including the twelve brochs surrounding Eynhallow Sound in Orkney (as explored in Chapter Seven). Indeed, such agricultural/marine positioning implies ‘resource management’, and this may also be suggested in the close proximity that some sites have to mineral resources too; something which may not be coincidental. For example, Edin's Hall broch on the Scottish Borders is located near copper mines (Dunwell 1999); suggestive of a desire to control these resources. The possible link between resources and status may be further alluded to in other features too, such as the souterrains, which, as already noted, are found beneath many Iron Age roundhouses in Scotland (and beyond), and are often argued to represent the material expression of a household's or a community's wealth (Armit 1999; Miket 2002), something which is debated further in Chapter Seven.

With this evidence, the idea that Atlantic Roundhouses functioned as material expressions of agricultural/marine establishment in a period of climatic decline thus remains a common and strong topic of discussion, with brochs (as arguably the most complex and monumental Scottish Iron Age structures) often being argued to have represented establishment and dominance over agricultural units or 'estates' of land (Dockrill, Outram and Batt 2006; see also: Armit 2002; 2003: 97-8; 2006: 254; Fojut 1982b).

However, one needs to be careful when suggesting that the development of monumental roundhouses (from simple to complex) and their positioning within pockets of good agricultural land – as well as the apparent surge of enclosed spaces in Iron Age Scotland (see: Armit and Ralston 2003: 193) – was the sole result of a climatic downturn during the Iron Age. After all, correlations between social change and climate change are complex and often inspire simplistic models. Therefore, when considering climatic impact, I think it best to begin by concentrating on the structures themselves and to ask how they dealt with aspects of their environment. Indeed, by revealing the ways that the domestic space was designed to withstand the stresses of the climate, a picture of the Iron Age 'house' in its environment shall become clearer, and with that, one can then progress to analyse the complexities of how the domestic space may have also functioned as a social and symbolic entity (e.g. control over resources; domestic and landscape symbolism).

As a form of vernacular architecture, developed locally, one could suggest that the increasing complexity of Atlantic Roundhouses throughout the Iron Age was influenced by the need to adapt the domestic environment in accordance with the worsening weather – a subject which should not be conceived as separate from either landscape or the archaeology of buildings (Tilley 2008b: 272; cf. Ingold 2005: 128). On this note, I wish to explore how the Iron Age brochs – or as Armit (1991: 182; 1992: 18) defines them, 'Complex Atlantic Roundhouses' – dealt with the weather in a period of climatic decline. I am using the brochs here as they are not only the most elaborate form of Atlantic Roundhouse, but they are also the most studied. It should be said, however, that many of the conclusions drawn here are also relevant with regards to other Scottish Iron Age 'house' types, such as the duns.

In order to explore how the brochs dealt with their environment then, I wish to compare their architectural features with those of the much more recent 'blackhouses' (a Post-Medieval Scottish form of vernacular drystone architecture), both of which shared somewhat similar environments. It should be noted that many writers addressing Iron Age Scottish archaeology have tended to adopt a somewhat passive view of the buildings of the Post-Medieval period in comparison to the Iron Age broch structures, often underrating their complexity, their interest to the prehistorian and their utility as an indirect but nevertheless important and relevant architectural analogy. Pope (2007: 210), for example, warns against the willingness to accept building traditions from recent, traditional Scottish culture as indicators of prehistoric rationality. Such critiques have been inspired by those who suggest that archaic forms of settlement, material culture, and social practice have survived somewhat intact into the present; thereby assuming a continuum between prehistory and the present to provide ethnographic parallels for use in the interpretation of prehistory, and thereby also assuming that present customs provide a 'window on the Iron Age' (cf. Fairhurst 1960: 73).

Of course, archaeologists frequently turn to ethnographic sources to supplement their understanding of past ways of life. But, if one studies the prehistoric past and relates it to practices in the present, one does run the danger of compiling interpretive mistakes (Trigger 1989: 391-395; Wylie 1982). The use of architectural analogy adopted here, however, is to simply widen the horizons of interpretation (cf. Ucko 1969: 262), and I would argue that although the architectural form of blackhouses and brochs were formed two millennia apart, the environment within which those architectural forms were created was similar. Indeed, as noted, though the Bronze Age was milder than today, there were long periods in the Iron Age which were probably colder, damper and windier (Lamb 1981: 55; Oswald 1997: 89), and without proposing a simple direct link between the two – and certainly without proposing a direct cultural link – I would at least suggest that the inhabitants of both types of building may have been responding to a damp and windy climate with similar solutions in their architecture. I am not attempting to link contemporary and prehistoric cultures here, nor am I arguing that there exists a historical continuity between these two societies. I am simply using an architectural analogy to help formulate questions and hypotheses about the broch structure in relation to its environment. This will allow an assessment of whether or not certain aspects of its architecture were inspired by environmental considerations. By taking this approach here, this thesis can then progress to consider other aspects (i.e. symbolic or social influences) upon Iron Age architecture in Scotland.

To begin this analysis then, we must first explore the purpose and function of the blackhouse.

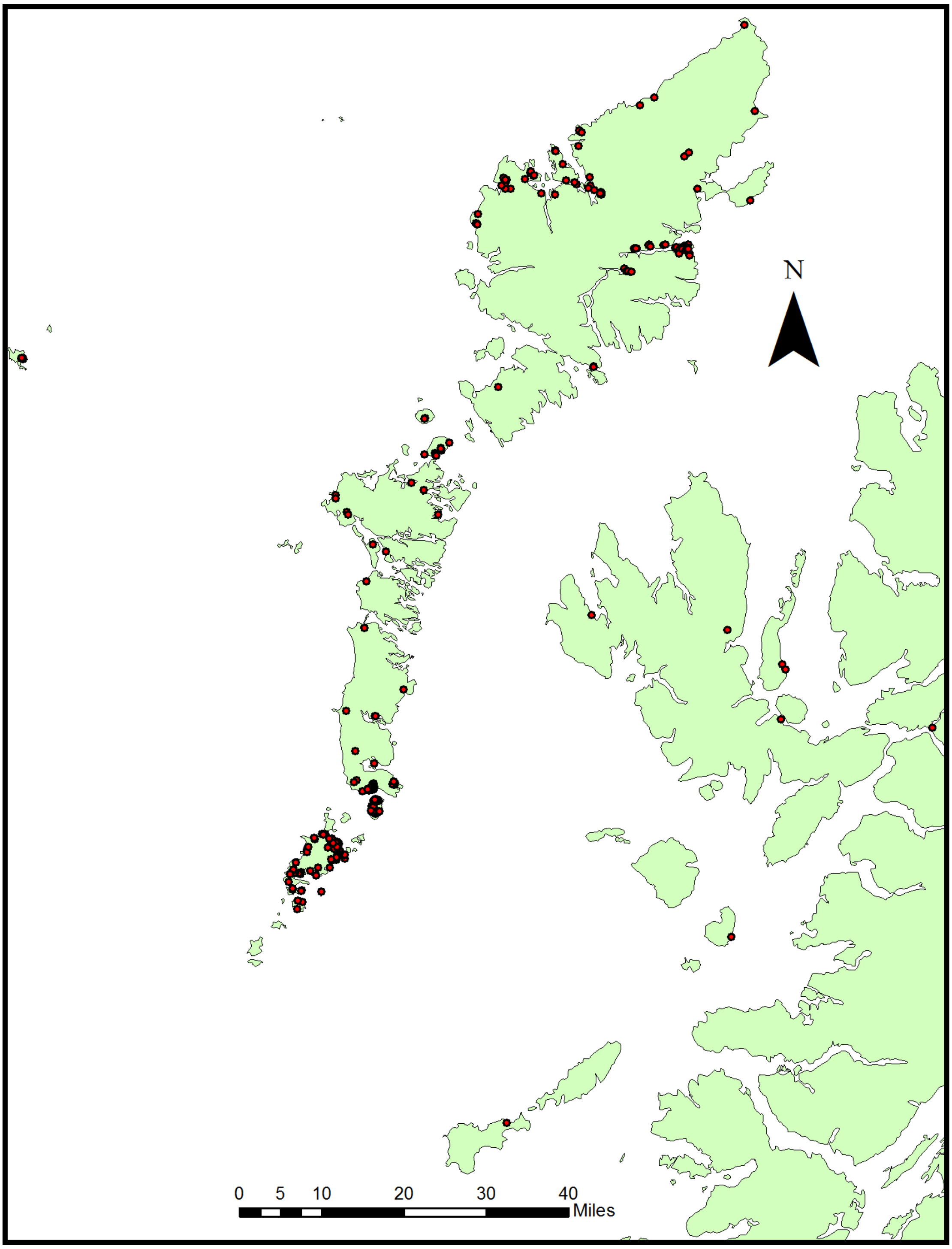
Shared Traditions, Similar Environments: Comparing the Brochs with the Blackhouses

So what is a blackhouse? To define these structures, the blackhouse is essentially a form of sub-rectangular longhouse, and although it has precedents in the Norse period of the eighth to thirteenth centuries AD, its form was still in use, and in construction, into the early twentieth century (Armit 1996: 214), and it is now generally considered to be a Gaelic house type. They were the most typical house form across the Highlands and Western Islands, and are found most numerously in the Outer Hebrides, as seen in Figure 3.1. It should be noted, however, that the 320 examples displayed in Figure 3.1 are those which have been recorded by Canmore within the Royal Commission on Ancient and Historical Monuments of Scotland database inventories, and originally, they were more numerous than this suggests, being much more common than the brochs (unless vast numbers of brochs either await discovery or have been destroyed, that is).

The blackhouse itself was a semi-permanent residence linked to the perambulatory settlement patterns of extended family groups within a clan's lands. Individual blackhouses were the homes of agricultural and single family units; whereas others may have been based as a single byre-house or, as at Arnol in Lewis, they could have made up a farmstead in which a collection of blackhouses were aligned to make a unit; something also seen on St Kilda. These units – i.e. these settlements – were known as *clachan* or *bailtean*, and consisted of small irregular clusters of blackhouses, ranging in size from 5m to 6m in St Kilda, 10m to 30m in South Uist, and between 23m and 26m in Lewis (RCAHMS 1988b; Hunter 1996: 167; Branigan 2005: 21; Branigan and Foster 2002: 129).

Though they were never entirely uniform in character, the individual blackhouse

Figure 3.1. The Distribution of Blackhouses (the 320 noted within the Canmore database inventories) in Scotland.



itself is generally recognised to have been a low, compact habitation built from loose stone, packed earth or clay and roofed with turf divots and straw, with slightly reclining walls so as to drain water outwards. Samuel Johnson, visiting a blackhouse in the Western Highlands in 1775, describes the wall of the structure as he saw it: ‘A hut is constructed with loose stones, ranged for the most part with some tendency to circularity. It must be placed where the wind cannot act upon it with violence, because it has no cement; and where the water will run easily away, because it has no floor but the naked ground. The wall, which is commonly about six feet high, declines from the perpendicular a little inward’ (Johnson 1925).

It is notable here that the walls and roof of the blackhouse possessed distinctly practical purposes, enclosing a well-insulated, warm and dry living space, typically built of two dry stone walls, up to 2m apart, with a core between them of organic material known locally as *uatabac* (Geddes 2010: 16). As wood is rare in these locales, the difficulty of procuring timber in the Western Isles is reflected in the poor, frail roof of the blackhouse however; as the roof simply rested on top of the walls. This roof structure was often formed of driftwood A-frames rather than crucks (Fenton and Walker 1981: 51), and these A-frames, in turn, supported a turf and thatch covering held down by weighted heather roping.

The spaces within the blackhouse were used for many functions, though little formal distinction existed between areas used for cooking, sleeping or housing cattle. Inside, the long, low and rectangular form of the blackhouse, there was a single living space, heated by a peat fire in a simple stone hearth in the centre of the floor, with the heavy peat smoke escaping slowly through the thatch. The lack of windows meant the interior was often dark and very smoky, and this is often assumed to have influenced the name, ‘blackhouse’, though it is in fact a mistranslation of the Gaelic word ‘*tugadh’*, meaning ‘thatch’, but which is phonetically similar to *tigh dubh*, or ‘blackhouse’ (Maudlin 2009: 46). However, the fact that these structures housed both humans and livestock (perhaps like the brochs; see: Mulville and Thomas 2005), and were heated by a central fire (though the building often lacked either a chimney or a window), has influenced the idea that these houses possessed notoriously damp, smoky and dirty interiors (for further details on blackhouse conditions, see: Parliamentary Paper 1884: 84; cf. Curwen 1938; Day 1918; Gibson 1946; Lorimer 1999: 520).

However, this belief may derive from the arguments made by the improvers during the Scottish Agricultural Revolution throughout the 17th, 18th and 19th centuries, in which the failings of the old system were becoming ever more apparent in an age of generally rising production and growing population, with new industries and crofting farms being required.

But what is important to remember for the purposes of this chapter is that the external structure, interior space and orientation of the blackhouse was developed to minimise the effects of the windy and wet Highland environment in order to create a warm, dry living space (though perhaps often dirty). Yet although the architecture and interior space seems to have been primarily functional, it would be wrong to assume that the construction of the blackhouse was solely a means of creating a warm dwelling for its inhabitants. Rather than a ‘sordid hovel’ (Parliamentary Paper 1884: 84), the blackhouse and its central hearth made up the social heart of Gaelic culture. The Highland *ceilidh*, or ‘gathering’, derived from communal storytelling, singing, and music sessions held around the glow of the central hearth through the long, house-bound winter months (Maudlin 2009: 46). Indeed, much of Scottish Gaelic culture is principally based upon this intangible kind of heritage, and the central hearth – and the enclosed space of the blackhouse itself – framed and informed the centripetal social ritual of the ‘*gathering’* (Lipstadt 2005). As a part of this, the blackhouses were not only adapted for the landscapes in which they were set, but they were also set within it, marking themselves as a part of it, as its inhabitants also felt; as Maxwell (1996: 1) describes, blackhouses were ‘integrated structures within the landscape…[whose] form, shape and colour merged naturally with the fields’ (cf. Pennant 1774: 216).

The blackhouse is thus a complex form of settlement, and recent studies of blackhouses located in the Western Isles emphasise this complexity by drawing on oral history, undertaking building analysis, and indicating details of material procurement, site preparation, maintenance and use (Holden, Dalland, Burgess, Walker and Carter 2002; Symonds 2001; Walker and MacGregor 1996). What is obvious from the literature however, is that like brochs, blackhouses were a distinctly indigenous innovation in which the design, building materials, architectural limitations and pretensions all fit into Scotland’s particular cultural and natural environment (cf. Brunskill 1985: 21), and we shall now explore the similarities between the two types of site.

The Broch and the Blackhouse: Different Houses, Same Elements

Though separated by millennia, both types of structure – broch and blackhouse – had similar traits to one another: both were drystone building types, both were frequently (though certainly not universally) built in similar locations, sometimes found very close to one another as at Dun Carloway on Lewis, and both were distinct types of local, vernacular architecture that drew on local architectural traditions, utilised local materials and local labour (Brunskill 1985: 21; Curl 1999: 706; Geddes 2010; Mercer 1975: 1; cf. AlSayyad 2006: xvii). Located within the climatically marginal Atlantic Scotland, both were also part of a distinctively north Atlantic building tradition, and were particularly well suited to the Scottish Highlands – its adverse weather and its harsh, treeless environment. Indeed, due to their ability to cope with their harsh environment, lessons from the construction of blackhouses have even been applied to more modern designs (Armit 1996: 213, note 8; Beaton 1997: 39; Carruthers 1996: 13; Walker and MacGregor 1996: 1).

From the analysis of blackhouses above, we discover many other similarities that deserve consideration. First, the stones of both the inner and outer facings of the walls of blackhouses were set sloping slightly downwards towards the outside, thus considerably reducing percolation of rain water into the interior of the house and facilitating drainage outwards. Those brochs which have maintained much of their original height (e.g. Mousa, Dun Telve, Dun Troddan) appear to also have had a slight inclination (Figure 3.2) which would have allowed water to drain from the roof (though this may have been emphasised somewhat over time as the broch’s walls may have buckled slightly during the last two millennia). Both the inner and outer walls of the tallest surviving brochs do lean towards the centre however, and if this were the case in the Iron Age also, then this inclination would have allowed water to drain while also providing a counterweight against the outwards thrust of a heavy roof.

Second, and perhaps more importantly, is the presence of double walling in both types of site, with a void in-between. For many blackhouses, particularly those in the west of Lewis, the thick walls (up to six feet thick) were composed of two shells, the space between which was filled with earth and turf, or rubble. This is a feature witnessed within various building traditions throughout Scottish history, and is even seen in the Neolithic ‘house’ at Knapp of Howar on Papa

Westray (Ritchie 1973; 1975; 1984; Traill and Kirkness 1937); which consisted of an inner and outer skin of drystone walling with the space between filled with midden material. Insulating wall cores such as these were a feature within many other Neolithic houses on Orkney, with midden material appearing to have been the favoured medium (Clarke and Sharples 1985). This method seems to have been later adopted in Bronze Age houses on Orkney too, such as that found at

Figure 3.2. Mousa Broch, Shetland. Note the slight inclination of its walls. After: Pattison (2013).

the 'Tomb of the Eagles' on South Ronaldsay, and indeed, the Early Iron Age roundhouse of Bu, also on Orkney (Bell and Hedges 1980; Hedges 1987a).

With regards to brochs, some of the more accessible galleries may have likewise been packed with insulating organic material (the archaeological evidence of which is not likely to survive either), like in the intra-mural spaces of blackhouses, thereby insulating much of the interior. For both blackhouses and brochs, this would not only have provided some insulation, but would have also reduced the amount of labour involved whilst further eliminating draughts in a wall without cement. However, heat insulation may not have been the only function of double-walling.

For drystone walled constructions, rain is often driven deep into the walls by high winds, and this would have been especially pertinent to those brochs located either in the Western Isles, or upon the exposed cliffs of Orkney and Shetland. The slight inclination of the taller surviving brochs would have also allowed water to seep into the wall. However, their intra-mural galleries (e.g. 'cavity walls') would have meant that instead of reaching the interior of the building, rainwater would have only penetrated the outer wall, while the inner wall remained dry (Armit 2003: 73). That said, however, this would have probably left the galleries damp for long periods of time. Furthermore, as the broch was built of drystone walling without cement, one can imagine that the 'tower' would have also been extremely vulnerable to high winds too, especially as the structure was weakened through the use of double walling.

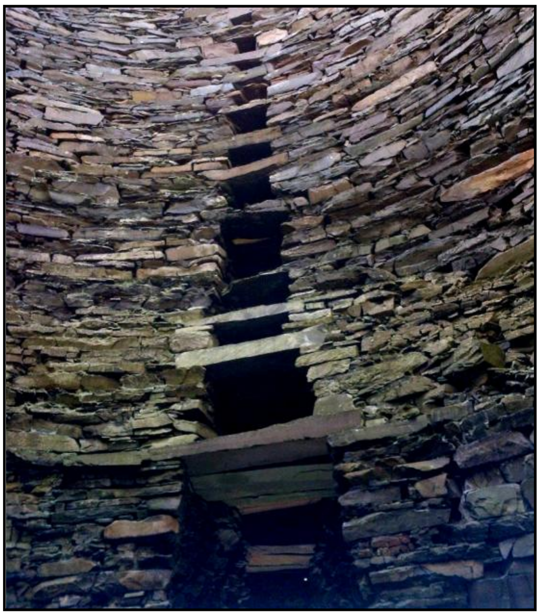
These weaknesses highlight another integral feature of broch architecture – the purpose of the broch's 'wall voids'. Though absent in blackhouses (presumably because they were not tower-like structures), they still require explanation here, because it is wall voids which permitted typical 'blackhouse features' (e.g. double walling, drystone construction) to exist within the tower of the broch.

Located within the inner walls of brochs, it has been argued that these long and tall staggered openings presented only a discontinuity in the fabric of the building and were thus fundamental weaknesses (Thew, Sutherland and Theodossopoulos 2012). However, they would have actually possessed multiple functions: providing ventilation for smoke, assisting with heat dispersal, and acting as a means of minimising the consumption of stone. Their omittance within other Atlantic Roundhouses, such as wheelhouses – which were usually subterranean – suggests that they were primarily intended to reduce the amount of weight bearing down from the upper wall at specific points, especially the entrance (see Figure 3.3); thereby actually protecting the double-walled drystone structure from possible collapse in high winds. Indeed, the entrance would have been the weakest point in the fabric of the structure and this would have been especially pertinent with regards to those brochs which were solid-based (see Figure 3.4 for a distribution map of solid-based and ground-galleried brochs across Scotland).

The solid-based broch would have effectively distributed the weight above the ground floor across the solid-base. But the entrance – as the only hollow space

Figure 3.3. Wall Voids above the Entrances of Mousa and Dun Telve.

Mousa, Shetland.
Author's Photograph.



Dun Telve, Glenelg.
Author's Photograph.

within the ground-level wall – would have been under much greater stress than the entrance of a ground-galleried broch in which the entirety of the ground-floor wall was hollow, thus allowing the weight to be distributed more equally across the base. Indeed, as Thew, Sutherland and Theodossopoulos (2012) discovered in their analysis, the collapse of any solid-based broch weakened through time, poor construction or lack of maintenance, would have tended to begin right above the entrance, where the wall was under the most strain. Wall voids, especially above the entrance of solid-based brochs, such as we see within the solid-based brochs of Mousa and Dun Telve (Figure 3.3), would have thus helped distribute the weight into the walls on either side of the entrance, and would have actually allowed a stable and tall structure to have been constructed. Indeed, it may be for this reason that there are more solid-based brochs (68 identified across Scotland) than ground-galleried (40 brochs). This need to spread the weight above the entrance (which was the weakest point) may also be hinted in those brochs possessing triangular lintels above the doorway (e.g. Clachtoll broch in the Highlands and Culswick in Shetland) thus distributing the weight of the tower above it into the surrounding walls (Figure 3.5).

Figure 3.4. The Distribution of Known Solid-Based and Ground-Galleried Brochs in Scotland. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.

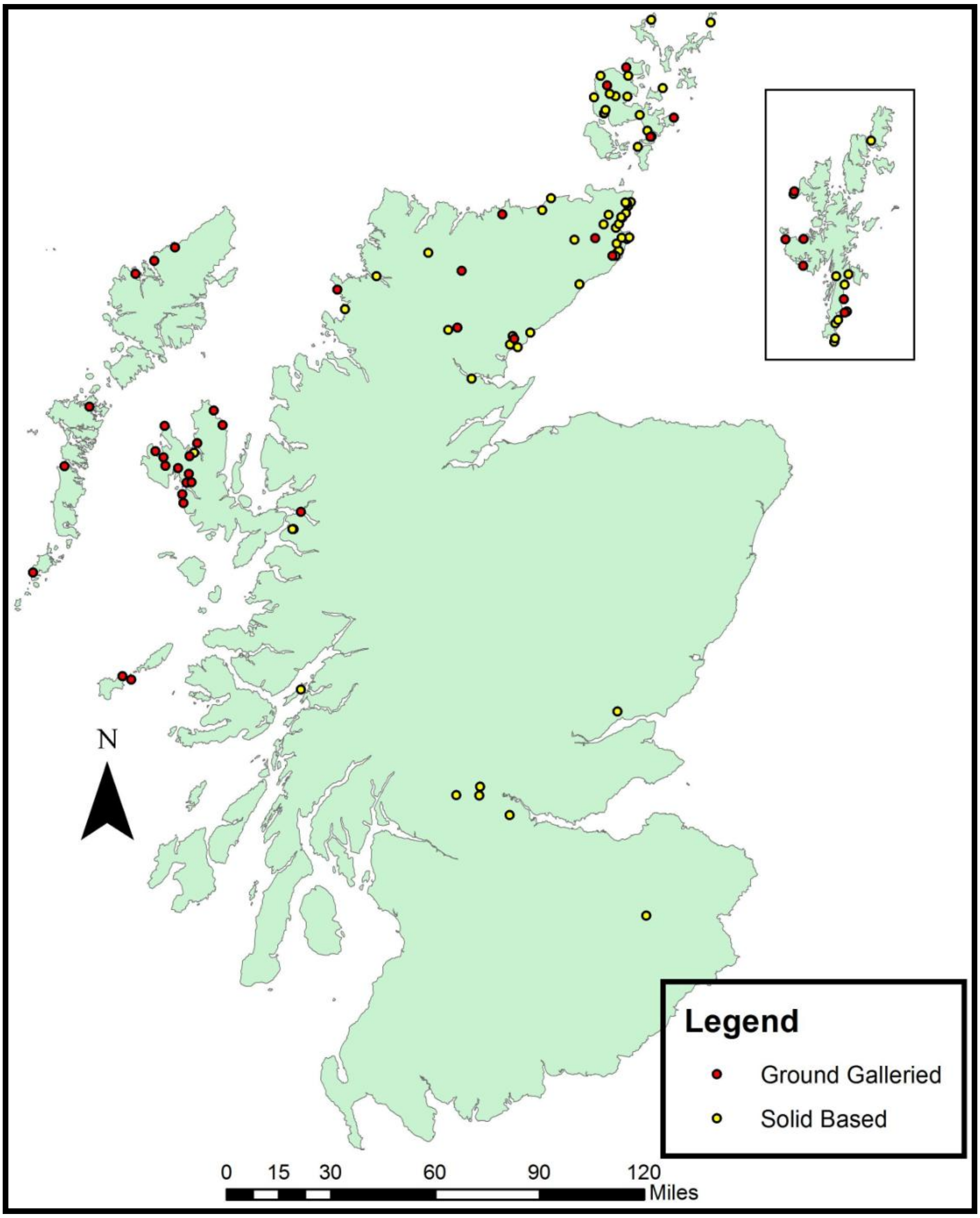
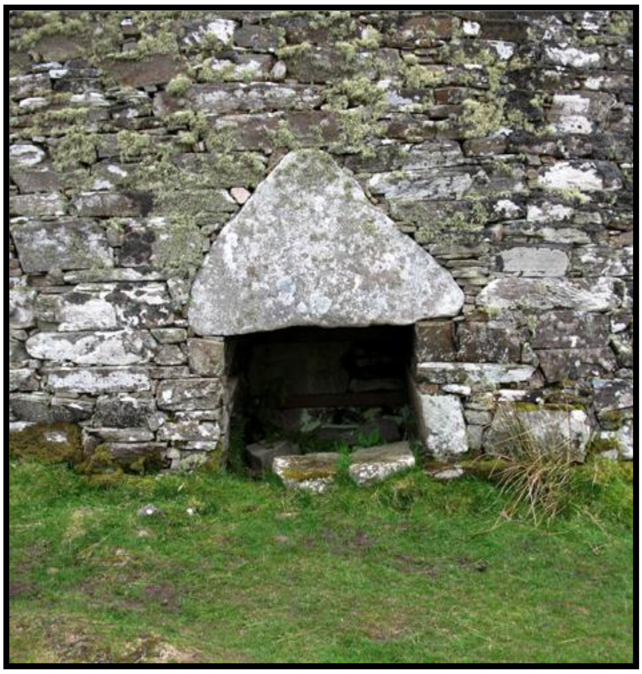
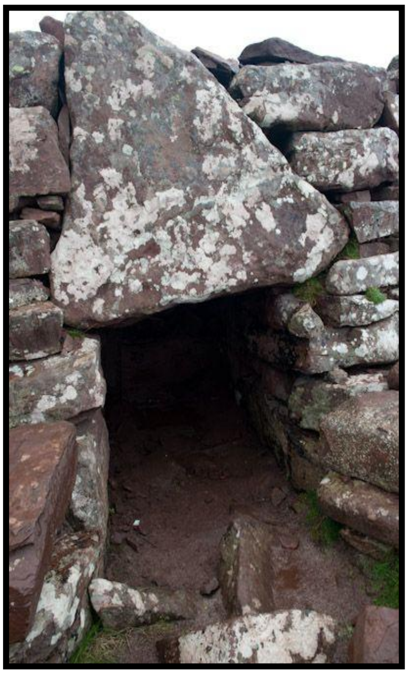


Figure 3.5. Examples of Broch Triangular Lintels.

Dun Dornaigil, Highlands.
Author's Photograph.



Clachtoll, Highlands.
Author's Photograph.



Culswick, Shetland.
Author's Photograph.

Another purpose for the wall voids, as put forward by John Hope (an Edinburgh-based architect), suggests that they also allowed warm air from the fire to circulate the building (Armit 1996: 126; Armit 2003: 73), an idea later put forward by Harding and Gilmour (2000: 69). This heating system would have aided to dry out areas that would become wet if the roof was supported on the inner wall, leaving the wall head open for repairs. The double walls and roof of the blackhouse held a similar function. Mitchell (1880: 54-55) mentions that 'such rain as does not simply wet the roof or fall through it, runs down into the body of the wall [of the blackhouse]'. The same feature is noted by Campbell (1938: 184) for blackhouses on Achill (Co. Galway), in which he writes, 'outside this wall [the inner wall]. . . another loose wall was run up, and the space between the two filled with sea sand, and then this was roofed . . . and covered with heath, which covering did not reach over the outside wall, and form an eave, but rested on the middle between the walls, and the moisture from above passed, as it should, through the intervening sand'.

The windowless single storey of the blackhouse, and its central hearth, would have permitted these areas to dry, at least in warmer periods of the year. The tower of the broch however, with its similar double walling and multiple wall voids would have meant it unlikely that a single central hearth would have been able to create enough heat to maintain dry galleries for prolonged periods of wet weather; and so the recesses between the walls (i.e. the stairway, the ground floor cells) would have probably remained damp for long periods of time (Maudlin 2009: 20). However, as the broch tower possessed multiple stories, it is probable that it also possessed multiple hearths, perhaps one on each level. These could not have survived in situ, but it is probable that these existed because only the use of multiple hearths would have dried the broch's galleries.

It is also reasonable to assume that in the wet environment of Northern Scotland, hearths would have needed to be lit for most of the day in order to keep the interior dry; suggestive of a somewhat bright and warm interior. Here, I wish to note that the hearths within blackhouses were kept permanently alight in order to keep the thatch from rotting, and partly to prevent the interior of the building from becoming too damp (Geddes 2010: 21). This was achieved with the use of smoky peat fires which have a long tradition of use throughout much of Atlantic Scotland (Carter 1998: 99; Dickson 1998: 105), with direct evidence of peat fires being associated with Baravat broch (Lewis) in particular; and with numerous individual peats and a 'peat basket' being discovered during excavation (Harding and Dixon 2000). So it is not difficult to imagine a peat fire in the centre of a broch – and perhaps others on multiple levels – with the wall voids aiding in the distribution of smoke and heat throughout the broch.

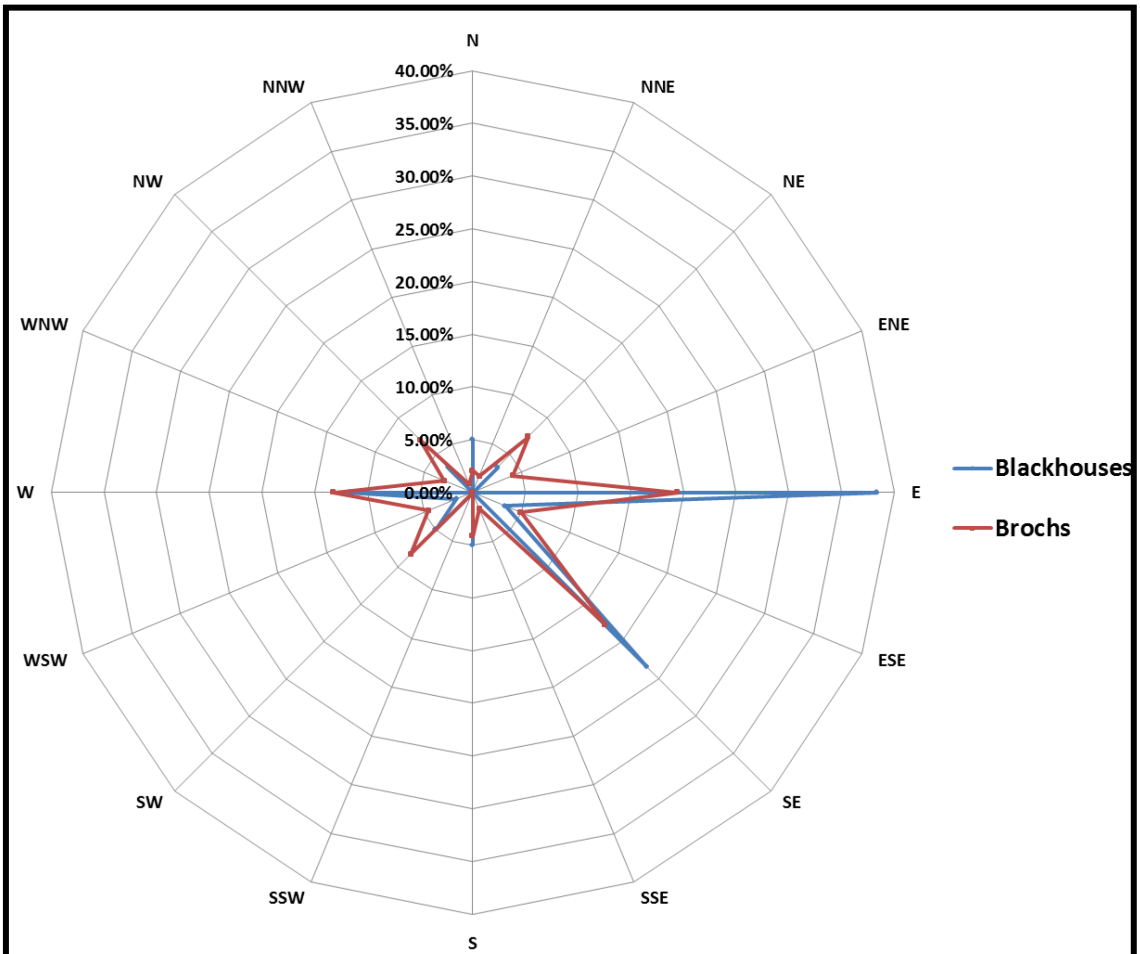
In the blackhouse, extra heat would have also been provided by storing livestock within the home, and though the general view is that the ground floor space of the broch was the primary living area, the sometimes poorly finished walls of the ground floor of particular brochs (e.g. Dun Troddan in Glenelg) in comparison to the finished quality of the upper levels could be suggestive that the lower floors were used to hold animals (see: Mulville and Thomas 2005), with inhabitants perhaps living more permanently within the upper stories. This theory also draws comparisons with both the blackhouse and the Viking longhouse, within which, humans shared the living space with livestock. If this practice was also being conducted within brochs, it may have only been necessary during the winter months when the extra warmth would have been most desirable and when livestock were in potential danger if they remained outside. Of course, though such a practice may have been carried out within certain brochs – such as at Dun Troddan – it is not necessarily a universal feature across Scotland.

With the majority of broch doorways (especially in Northern Scotland) facing towards the east, south or west (i.e. towards the sun), light, whether direct sunlight or just ambient light, seems to have been desired within the ground-floor level. Though such orientations towards the sun may have simply been intended to ensure that livestock within the ground floor had some light (especially during winter), it also suggests that the ground floor was a utilised space for inhabitants too, at least during the day; demonstrating one of the more interesting similarities between blackhouses and brochs: that of orientation.

It is important to note here that many blackhouse doorways seem to have had a distinctly purposeful orientation, and from an analysis of all the blackhouses still remaining in Scotland, I have noted sixty which have discernible entrances (Figure 3.6). From this, we can see that these structures tended to face towards the sun (E, SE, W) while avoiding the prevailing winds of the SW. Indeed, these three cardinal points account for 73.33% (44 sites) of blackhouse orientations. The east is most popular with 38.33% (23), and then the SE with 23.33% (14), and the west at 11.67% (7).

Maudlin (2009: 46) notes that the orientation of blackhouses contributed greatly to the warmth of their interiors; their rounded, narrow gable end facing the

Figure 3.6. Orientation Comparison between all available Brochs (242) and Blackhouses (60).



Cardinal Point	No. of Blackhouses	No. of Brochs
N	3	5
NNE	0	4
NE	2	18
ENE	0	10
E	23	47
ESE	2	12
SE	14	43
SSE	0	4
S	3	10
SSW	0	0
SW	3	20
WSW	1	11
W	7	32
WNW	0	7
NW	2	17
NNW	0	2

prevailing wind, and any openings, such as the door, often being placed on the southern side – towards the sun. These provisions coincided with the Gaelic proverb, 'An iar's an ear, an dachaigh as 'fhearr — cul ri gaoith,'s aghaidh ri grein,' which translates: 'East to west, the house that's best — back to the wind and face to the sun'. The rounded corners and end walls which give these houses a rounded-rectangular or ovate-oblong form also leave nothing on the outer surface to catch the wind. The rounded gable of the blackhouse also highlights another point however – was the rounded nature of the broch (and also the rounded edges of the Neolithic Knapp of Howar on Papa Westray and the simple stone built Iron Age roundhouse in general) developed to withstand the strong winds which would have been present around the cliffs of Northern and Western Scotland upon which many brochs were located. Indeed, a rectangular building, without rounded edges, would have been far more exposed, and thus weaker, especially on its corners. One could also assume that lower buildings (like the blackhouses) would have been better suited to Scotland's environment, without the top-heaviness of some of the brochs, such as we see at Mousa. And yet, Mousa, even with its top-heaviness, remains one of the tallest and best preserved Iron Age structures in Europe, in spite of its extremely exposed location and antiquity.

Practically speaking, it may even be that the tower and its long entrance passages were simply a means of allowing strong draughts to be generated, which in turn would have lifted interior smoke through the roof space and wall voids of the broch. It should be noted here that blackhouse doors were usually kept open in most weather conditions to help ventilate the buildings (Geddes 2010: 21), and this may have been true with regards to the brochs as well, especially if further ventilation was required, though we should also recognise that smoke can be useful: extinguishing sparks, preserving roof materials, deterring insects and can also be used to smoke foodstuffs (Walker and MacGregor 1996: 27).

Comparing the orientation dataset of blackhouses to that of the brochs, we find that although the two sets are similar, the brochs do have a wider range. We can see that the E/SE arc (the light/shelter optimum) was the preference for both types of site however, with 65% (39) of blackhouses orientated within it in comparison to the broch's 42.15% (102 brochs). The slight preference for due west can also be seen, with 13.22% (32) of broch doorways in comparison to the 11.67% (7) from blackhouses.

The eastern arc (NNE-E-SSE) accounts for 68.33% (41) of blackhouse orientations in comparison to 57.02% (138) of broch orientations. The brochs do have a higher proportion facing the western arc (NNW-W-SSW) however, with 36.78% (89) in comparison to 21.67% (13) from the blackhouse dataset; a difference of 15.11%, suggesting that either western facing brochs were located in areas where the western side of the broch gained more sunlight than the eastern, or that there was perhaps a symbolic or social significance behind such orientations, as explored further in Chapter Five. With regards to the southern arc (SE-S-SW), both sets are very similar, with brochs at 31.82% (77) in comparison to the blackhouses at 33.33% (20), a margin of only 1.51%. This seems to suggest a focus on sunlight for both types of site. With regards to the northern arc (NE-N-NW) however, 19.01% (46) of broch orientations lie within it, in comparison to the 11.67% (7) of blackhouses; a difference of 7.34%, suggesting that some of the brochs may have been more summer orientated, as the northern arc receives direct sunlight only during the summer months.

However, despite these patterns, many commentators have noted that natural light would have been mostly absent within the broch, and parallels have been drawn with the acceptance of almost no natural light inside blackhouses (Armit and Fojut 1998; Hamilton 1968); as Thomas (1867: 155) notes, only a ‘dim religious light’ pervaded the [blackhouse] on even the brightest days. But it is obvious that blackhouses were orientated to capture whatever light was available, and this seems to have been true with regards to the brochs as well.

With regards to the ways in which light may have influenced doorway orientation and the daily function of the roundhouse, Pope (2007) has previously noted that although direct sunlight is perhaps less reliable than daylight ambience within a roundhouse, both are nevertheless best sourced from the southern sky (cf. Oswald 1997: 92), and so a southern orientation is preferable. However, a southern facing doorway, when open, would have also admitted a certain amount of heat from the sun (especially in a windowless drystone structure). Indeed, one can imagine that in the Scottish Highlands and Islands, any method of gaining extra heat within the domestic space would have been welcomed.

What the above analysis also suggests is that the blackhouses had a shared and strong tradition of orientation which had practical undertones. The brochs on the other hand – though they represented a wide and uniformed tradition of architecture – did not share that same concern with regards to doorway orientation, though it would seem that light was wished for within the structure, as few face northwards. An inspection of lightscapes in the landscape and how they influenced site emplotment and orientation is thus required, and will be demonstrated with regards to the brochs of Orkney and Shetland in Chapter Five.

Conclusion: Seeking the Broch 'Home'

From the above analysis, it would seem that the broch, as one of the most impressive and dominant examples of vernacular architecture in Iron Age Scotland, sought to deal with the elements during a period of climatic deterioration. This is demonstrated by (a) the broch's drystone construction; (b) its double walling; (c) appropriate orientation (though this depends on region); (d) its rounded nature; (e) its thick and pitched outer walls; (f) its long entrance passages, and (g) its wall voids. Many of these architectural traits are shared with those of the vernacular blackhouse (e.g. pitched outer walls, double walling, drystone construction, rounded walls to deflect the wind, and entrances which were orientated towards available sunlight), thus suggesting a clear awareness of the elements which affected the domestic space and the ways in which these could be countered.

However, one needs to also be aware that the brochs were constructed in what one may assume to be a very different social context to the blackhouses, and other features of broch architecture continue to confuse researchers. Indeed, there are many characteristics of the brochs which deny a purely practical explanation for which an examination of blackhouses might provide enlightenment. For example, unlike blackhouses, many brochs were intentionally positioned in extremely exposed locations (cliff edges; loch sides), such as we see at Nybster in Caithness, or Borwick on Orkney, and this leads us to a secondary point: within such locales, why would builders construct a tower (or any multi-storied building) – structures vulnerable in a landscape so fully open to the elements. Furthermore, their thick and tall walls, inconsistent patterns of orientation, imposing entrances, their often precarious positions in the landscape, as well as many other interior features, suggests that the domestic space was not solely constructed and maintained in order to protect the inhabitants from the environment. Certainly such factors allude to more than environmental practicality then.

One would, of course, expect this from any dwelling however, because, although the environment is usually a significant factor when construction on a ‘house’ begins, generally speaking, the domestic space also acts as the context by which people are able to organise and maintain social and moral orders – i.e. it becomes a ‘home’. Indeed, within any socio-cultural context, cultural beliefs and social practices influence the ordering of the ‘home’ itself (Benedict 1946; Dovey 1985). With this in mind, we need to consider the ways in which other considerations are given to Iron Age brochs, and be careful not to play down the symbolic and social aspects of architecture so as to make a particular point (i.e. that brochs were solely functional in relation to their environment). To illustrate this point, I return to the blackhouses, which for many may seem to have been highly influenced by purely practical concerns relating to the environment. However, they were still integral within a ritualised worldview, like all ‘homes’; for example, as Hingley et al. (1997: 455) note, small metal objects (e.g. horse shoes) were often added to the wall core of blackhouses in the Western Isles for good luck (Walker and McGregor 1996: 4; cf. Hingley 1992: 38).

Likewise, we need to be careful not to consider the broch as a purely functional structure – as has been the examination within this chapter – and should try and view the broch as an integral component within a worldview which, though highly influenced by the environment (much like the blackhouse), was probably more symbolically charged than many would assume from an architectural and typological study alone. I would stress then that the functionality of the broch (from an environmental perspective) does not, and almost certainly did not, preclude a symbolic and cosmological significance. Indeed, functionality, ideology, religious belief and cosmology; all of these influence the form that houses (and settlements in general) take, and it is these issues which shall be explored further in Chapter Four.

Chapter Four

The Holistic 'Home': The Broch as Castle, Temple, Calendar and Farm

As noted in the previous chapter, the broch was well adapted to its environment and climate, as we would expect from any dwelling within which people lived. However, the domestic space would have been influenced by many other factors that did not solely relate to the environment. Indeed, it would have doubtless possessed social and moral orders which deserve attention. The aim here then is to move away from the idea of the broch as a wholly functional structure relating to the environment alone, and begin to ask how the broch was constructed so as to establish and maintain a sense of 'home' in Scottish Iron Age society. We must therefore begin by asking, what is a 'home' and how can we study it?

Introduction: Defining (and Confining) the 'Home'

The terms 'house' and 'home' are often used in conjunction with one another, but they are not exactly identical, or necessarily related. Indeed, though one may consider the 'house' to represent the structure within which people live (i.e. the dwelling place), the idea of the house as a 'home' is more complex, with a large variety of theoretical perspectives relating to it. They include investigations into the historical (Haraven 1991; Kumar 1995; Massey 1995; Troy 2000), economic (Cross 1993; Pugh 1990), and cultural contexts of 'home' (Bhabha 1997; Messerschmidt 1981; Oliver 1987; Rapoport 1982; Thrift 1983; Ward 1999), to the geographical concept of 'sense of place' (Jackson 1995: 87; Pred 1983; Relph 1976) and the ways in which we create and maintain ties and give meaning to particular kinds of places, and/or include or exclude others (Sibley 1995). But for the purposes of this chapter, how does one summarise the concept of 'home'?

Homes – or as Lawrence (1985: 129) describes them, 'warehouses of personal experience' – are, in the Western sense at least, the primary areas of family social relations and kinship interactions (Lawrence 1995: 57); places in which humans carry out the everyday routines of family life (Allan and Crow 1989; Cherry 1984; Goldscheider and White 1991; Valentine 1999; Werner 1988). But such a definition is perhaps too narrow – and too Western – to illustrate how the home acts as the context within which people are able to control, or at least maintain, meaning relating to the self and also to society at large (Blunt 2005: 1-22; Marcus 1995: 13-14; Pallasmaa 1995; Terkenli 1995: 325). Indeed, ‘home’ fundamentally represents the context where resources are able to be directed towards the maintenance of numerous, and universal, facets of human life, generally including: (a) self-identity; (b) family; (c) social relations; (d) self-esteem; and (e) notions of insiders/outsiders (Allan 1989; Laumann and House 1970; Lawrence 1985; 1987; Rapoport 1969).

Homes thus come to be imbued with socio-cultural meaning, and the ways of living within the home – i.e. the organisation and selection of objects, or the movement performed within its spaces – are often highly circumscribed by moral and symbolic prescriptions often associated with the likes of family, gender and class position (Madigan and Munro 1991; 1996; Wood and Beck 1994). One may presume that this ordering of the world is necessary because, as Bourdieu (1977: Chapter Two) argues, the home generally acts as the location of the earliest learning processes, and so the basic schemes of perception, thought, and action need to be embodied within it. The home is thus the context for which the basic categories of the world – the categorisation of people, things, and practices – are to be learnt, and in this way, homes become the symbols of selves and cultures.

Of course, taxonomies established within the home are infinitely variable; temporally, spatially, and socially. The activity of eating for example, though common to all human beings within every culture, differs markedly in its spatial and temporal manifestations according to cultural patterns and rules. Spatially, westerners eat while seated in chairs, Indians sit on the floor, whereas Ancient Romans and Greeks reclined (Fotopoulos 2003: 161). But there are also intricate and complex differences with regards to where one eats, with whom, and who sits where; thus demonstrating how certain routines and rituals are to be followed within the home. Certain spatiotemporal categories (e.g. ‘dinner’), with their own rules and expectations, thus emerge within each culture, and as patterns of experience and behaviour stabilise over time, so do the spatial arrangements and environmental props that support and evoke those experiences (Dovey 1985).

This means that when constructing the home, patterns of dining, talking, and sleeping will form the bulk of assumptions when construction begins, as it is these patterns that orient us in space, in time, and in the socio-cultural context (cf. Benedict 1946; Tuan 1977). Comprehending the social nuances of the prehistoric home is obviously going to be difficult then. This is not only because the social and moral orders which inspire the ordering of the prehistoric home are largely invisible to us, but also, an interpreter in the present, possessing a culturally specific view on what constitutes the 'home', is at risk of making a variety of assumptions (just like with the concept of light), and this occurs with regards to any interpretation of what constitutes the 'home', perhaps unavoidably. In response to this, this chapter chiefly explores the interpretations and 'assumptions' which have thus far been made on the broch, while also attempting to explore avenues which may help us comprehend the Iron Age home, and thus society, in Scotland. I must therefore begin by asking how the broch 'home' has thus far been interpreted.

Though generally assumed to have been 'domestic' structures – in the sense that they acted as human dwellings – the purpose of the broch, and by association the social practices of those who dwelt within them, is an area which remains highly debated, with brochs generally being seen as status symbols, defensive structures, refuges and farmhouses. And yet, despite such theories continuingly being put forward, there remains no agreement over why these structures were constructed and what they may have symbolised to the societies that built them. Particular themes do dominate however (Heald and Jackson 2001: 138), and include: (a) that brochs were the typical households of local populations, not relating solely to a single social class (e.g. Armit 1992: 126; 1996: 129); (b) that for some regions, brochs represented the pinnacle of a hierarchical settlement structure (e.g. Parker Pearson, Sharples and Mulville 1996); and (c) that brochs were the fortified farmhouses of tribal elites, each broch controlling a territory that was supported by local tribesmen and their families – traditionally one of the more popular beliefs (e.g. Scott 1947: 15; Heisler 1977; Fojut 1982a; 1982b; MacKie 1997a; 2000).

Each one of these probably holds an element of truth, with each being dependent on region and period. However, each one is perhaps unavoidably influenced by western conceptions of what constitutes the 'house' and the 'home', and so we need to be cautious to take them at face value, as we are always in danger of imprinting our own cultural views upon the record. Indeed, with regards to the prehistoric home, that which seems most obvious to us can often be assumed to be fact, with common sense often substituting as truth. It is thus unsurprising that the answer to the purpose of the broch which is most often put forward is that which seems most obvious (at least from a western perspective): that, although they were homes, they also acted as defensive (Nieke 1990: 135; Peltenburg 1983: 202), even militaristic, structures (see: Blythe 2005), akin to Medieval castles; expressing a strong sense of communal power and/or isolation (Childe 1935).

The interpretation of the broch tower as an agrarian fortified home – similar to those made on the tower-houses of Classical and Hellenistic Greece (see: Lock 1996; Morris and Papadopoulos 2005; Osborne 1992) – guides our judgement of Iron Age society in Scotland, and influences us to interpret its cultures as aggressive, insular and isolated, perhaps wrongly. And so in response, we must query and challenge these assumptions on the home.

The Defensive Home: The Broch as Castle and Fort

The defensive interpretation of the broch may, at first, seem understandable. Monumental in scale, the impression one would have gained from the broch tower would have probably been one of ‘authority’ and ‘permanence’; with the broch itself acting as a confident symbol of endurance and power – a common, and widespread theme with regards to built space (see: Arnheim 1977; Baird 1995; Forster 1982; Frampton 1997; Jackson 1980; Riegl 1982; Schwarzer 1994; Trigger 1990; Zukin 1991). Indeed, imprinted upon the landscape, the visual dominance of the broch tower – the height and verticality of which would have had a powerful, unconscious effect upon the viewer (see: Keltner, Gruenfield and Anderson 2003; Winter 1973; Lakoff and Johnson 1980; 1999; Gibbs 2006; Schubert 2005; Schubert, Waldzus and Seibt 2011) – was often further emphasised by the preference for locating in highly visible areas such as cliff promontories, hill tops and small islands (Armit 1997a; Fojut 1982b); something quite dissimilar with regards to the blackhouses. And so it is unsurprising that the broch has commonly been suggested by many scholars to demonstrate a defensive capability (Cunliffe 2001: 337; Fojut 1982b: 53; Hingley 1992: 19; MacKie 2008: 267); something which is apparently supported by so-called ‘defensive’ features – i.e. height, guard cells, lack of windows, ditches, thick stone walls (Cunliffe 2001; Curle 1927: 291; Fojut 1982b: 42).

However, I would argue that despite their positioning in the landscape and their fortified appearance, broch defensibility is highly questionable, with the structure itself only able to deter small raiding parties at best. Indeed, the material associated with these structures is usually just domestic (Sharples 2003), with

Figure 4.1. Comparison between Coastal Castles and 'Tower Houses', and Brochs. *Author's Photographs.*

brochs rarely being associated with weaponry, long distance imports or prestigious metalwork (with some exceptions, such as we see at the first century AD broch at Leckie, Southern Scotland; MacKie 1982; 1986). Furthermore, only two brochs show potential signs of successful assault –

Leckie Broch in Stirlingshire (MacKie 1982; 1986) and Dun Ardtreck on Skye (MacKie 2002b: 315) – and this destruction may have even occurred late in the broch's history. Indeed, as Blythe (2005: 248) notes, there is no evidence of a successful attack occurring at a time when brochs were first being constructed.

The broch structure itself would have probably been impossible to defend from a sustained attack anyway, and although their solid high walls appear insurmountable, the structures were fundamentally weak. First, brochs would have been easily fired; and if we take the Early Medieval Irish round towers as comparisons to the brochs, instead of obvious places of retreat, local communities under attack would have probably fled (assumingly with their livestock) rather than seek refuge in the confines of what were effectively 'enormous chimneys-in-waiting' (O'Keeffe 2003: 74); something which would have been accentuated within the broch due to their lack of windows.

Second, the drystone walling of the broch would have provided foot and hand holds, presenting an easy climb and there is no evidence that access to the wall head was similar to the battlements seen on Medieval castles. The deeply recessed entrances common to broch architecture would have also been difficult to safeguard and it is notable that many brochs do not actually retain so called 'guard cells'. Armit (2003: 64) notes that the position of the door does vary however, though it is often recessed towards the inner end of the entrance passage, which he argues may have provided some shelter for the door, while also preventing an attacker from taking a run at the door with a battering ram. Equally however, being located deep within the walls of the broch (itself without windows), this positioning of the door may have been a way of emphasising the doorway, highlighting this area as the only entrance into the structure and perhaps markedly defining the space as significant.

With this in mind, we should begin to ask whether the theory of the broch as a primarily defensive structure has been somewhat guided by studies (and assumptions) which focus on the architecture and landscapes of Medieval castles, as there are obvious and clear parallels between the positioning of brochs and castles in Scotland. Indeed, the tendency for brochs to be positioned upon isolated cliffs or upon small islands seems very similar to the locating of Medieval castles in Scotland (Figure 4.1), especially tower houses, such as we see at Dunnottar Castle in Aberdeenshire; Duntulm Castle on the Isle of Skye; Gylen Castle, near Oban; and Kilchurn Castle in Argyll (cf.

Tabraham 1988; for Irish tower houses, which may have been similar in this regard, see: Barry 2006; Sherlock 2011). Like brochs also, castle positioning in Scotland tended to have a focus on seascapes (McNeill 2002), something which was central to the maintenance and projection of power in Medieval Scotland, with the locating of the castle (and brochs, as will be explored in Chapters Six and Seven) often making a very strong visual impression from the sea (also see: Cooney 2003; Phillips 2003; Richards 1996).

Such similarities have led to assumptions being made upon brochs. For example, Medieval castles possess an obvious military function and are thus synonymous with colonisation and the imposition of alien settlements, both rural and urban (Creighton 2009: 6; O'Keeffe 2001; Stokstad 2005; Sweetman 1999: 41). The shared traits between the locating of brochs and castles in the landscape has thus helped guide the idea that like castles, brochs were also foreign developments; the architectural tool of an invading elite attempting to establish themselves among the native inhabitants (see: Childe 1935; 1940; 1946; Fergusson 1877; Hamilton 1957; 1962; 1963; 1965; 1966; MacKie 1969a; 1971; Piggott 1966). As Medieval castles are also often associated with violence, social instability and conflict, it may be that these themes have also been attributed to Iron Age society in Scotland (cf. Alcock 2003: 179-200; for further research into the nature of Iron Age warfare/violence, see Giles: 2008: 66; James 2007). Such comparisons have not only been made on brochs however.

As its namesake suggests, the Iron Age hillfort, like the broch, has also often been argued to have been an expression of territorial conflict and defensibility due to their seemingly defensive positioning, with both Armit (2007: 36) and James (2007: 164) arguing that they represent the best evidence for prehistoric warfare (for a counter argument, see: Lock 2011). Indeed, hillforts have long been viewed in the context of war and invasion (Cotton 1954; Feachem 1971; Hawkes 1931; cf. Sharples 1991a), although they almost certainly served a variety of social and symbolic functions too (Bowden and McOmish 1987; Collis 1996; Cook 2013: 77).

Returning to the brochs, the idea that they acted as expressions of household isolation and independence has perhaps also been guided by the understanding of the Scottish castle as something distant, remote and mysterious; an idea which has been inspired by the romanticism of the Scottish landscape and the surviving ruins in the modern period (Scarles 2004; Gold and Gold 1995). Indeed, one must be careful making such assumptions, and although the broch was often positioned in apparently isolated areas, it does not necessarily correlate that broch inhabitants were likewise seeking to appear independent from a larger social network.

Such an interpretation of the broch as an expression of defence thus largely represents an assumption based on our own history and values. With this in mind, we can again query the existence of a 'familiar Iron Age' (Hill 1989) in which that which seems familiar (and obvious) to us is imposed on the past. But this highlights another 'familiar' assumption however – that the broch was also a wholly practical structure, and was thus secular. For a seemingly secular (and nationalistic) society such as our own, a militaristic approach to architecture may be assumed to be the most obvious expression of power, and it may be for this reason that the broch is sometimes assumed to be thus. But the often assumed expression of monumental defensibility is only one way (unlikely in this case) in which power can be expressed.

Indeed, it is important to move away from the idea of the broch as being an *effective* defensive structure (as opposed to the appearance of defence, akin to Renaissance, if not Medieval, castles perhaps; see Johnson 2002), and ask how it operated as a 'home' for a society which, one can assume, was very different to our own; influenced by factors which we, as modern men/women, may overlook or disregard, such as issues relating to cosmology, ritual, gender, class, hospitality, respect, honour, and identity politics relating to appropriate ancestry. All of these can act as expressions of power and meaning within the home. Indeed, as noted at the end of Chapter Three, functionality, ideology, religious belief and cosmology; all of these influence the form that settlements take; the appearance of their facades, their internal divisions, their positioning in the landscape and also, their orientation (see: Blanton 1994; Frazer 1968; Parker Pearson and Richards 1994; Oliver 1987; Waterson 1997).

Of course, it is obviously difficult to decide which angle one should take when approaching the interpretation of the Iron Age 'home'. However, the latter area – of doorway orientation – is potentially one of the most interesting, and perhaps most enlightening, avenues of exploration with regards to discovering how the broch home was conceived and maintained by its inhabitants. This may at first seem surprising, because for many, the doorway may be understood as a straightforward and simple spatial structure; a practical feature permitting the entry of people and light. As explored very briefly in the previous chapter, broch doorways seemed to have been orientated to capture whatever light (or heat) was available. But this is certainly not the whole story, and we need to consider how complex the perceptions and feelings which a doorway engenders can actually be. Indeed, the human structures or values of 'home', 'shelter', 'passage', 'entry', 'security', and 'exiting' are all bound up in this one simple spatial design (Hammer 1981: 382), and this straightforward configuration of a doorway thus makes values possible; indeed, it even suggests and invents them. As such, it represents an area of great import with regards to discovering the meaning which broch inhabitants may have wished to establish and maintain within the context of the home. And as 'home' is always associated with social and moral orders, its study may tell us much about the values of society at large.

Many of those who have studied the entrances (and orientations) of Iron Age roundhouses in Britain have moved away from approaches which have tended to see the home as a purely practical, and seemingly secular dwelling, and have begun to explore the potential impact and influence of cosmology and symbolism upon the entrance and the home, asking questions on how this affected and influenced the organisation of those within (e.g. movement around the house; gender and class divisions). This is a significant area of study with regards to comprehending the nature of society, as noted, and for this reason, I wish to move on to explore these studies which have queried the impact and influence of doorway orientation, and how this seemingly simple feature may have helped order the home.

Reasoning out Orientation: The Cosmological Home?

There are many reasons why certain orientations are selected and standardised and others are not. For the Toraja of Indonesia, houses are orientated towards the north, which is a direction of social significance associated with the source of the rivers of Sulawesi (Waterson 1997: 94). Traditional Japanese houses are oriented to the south, avoiding the north (Hendry 1981: 217); something which is also prevalent in Chinese housing and Chinese town planning (Blanton 1994: 81), both of which are influenced by the need to harmonise the urban space with the cosmic order (Wheatley 1971). Again from Indonesia, the Savunese build their houses in conjunction with their cosmological beliefs, on a west-east axis only and facing either of these directions. As Kana (1980: 225) notes, for the Savunese, ‘a house that is positioned incorrectly “*cuts the land*”, and this crosscutting direction is acceptable only for the grave of someone who has…died an “*unnatural*” death’ (cited in Faust 2001: 130). The Endo Marakwet people of the Cherangani hills of Kenya, however, strictly avoid the east, preferring to avoid the eastern valley that lies below them (Moore 1986: 45).

The three monotheistic faiths provide a few other examples, each one orientating their religious structures towards specific directions: eastwards for Christianity (the location of the rising sun); toward Mecca in Islam; and toward Jerusalem in Judaism. Within the Graeco-Roman world, cities, buildings and even fields were all influenced by the movement of the sun however (North 1996: 583), whereas the landscapes chosen to position Maya cities were related to the positions of the constellations (Guidoni 1979).

Cardinal directions too are embodied within much sacred and domestic architecture; the faces of Egyptian pyramids for example were each aligned upon a cardinal point with great accuracy (Edwards 1947: 208-209; Neugebauer 1980), with the east believed to have been the location of the sun’s daily rebirth. Funerary temples were thus attached to pyramids on their east side to maintain their associations with rebirth and renewal (Magli 2009; cf. Chase and Chase 1994; 1998).

This clearly demonstrates that there are countless reasons why specific orientations are preferred by some cultures while others are avoided. As briefly observed in the examples above, there are many instances in which orientation can be influenced by a cosmically preferred direction or location (e.g. Frazer 1968: 47-48), and orientation can also be determined by the cosmological significance that is granted to geographical and topographical elements too (e.g. Waterson 1997: 94; Aveni and Mizrachi 1998). On the other hand, there are of course more practical, secular reasons for an orientation, as alluded to in the previous chapter. Take for example, James’ (2003) study of timber-framed Medieval halls in Herefordshire which predominantly face south-west, into the prevailing winds. This orientation is intended to help remove smoke from the open hearth by allowing draughts to move smoke from the upper-end accommodation towards the service-end of the hall, where it could then exit through a smoke louvre in the lower bay, or drift along beneath the ridge of an in-line service bay to leave through vents (James 2003: 28). Though draughty, the west side accommodation of the hall was left smoke-free.

Likewise, Kenworthy's (1988) study of thirty-six barns built for the purposes of grain threshing and winnowing is similar in this regard. From this study, solar radiation does not seem to have been a significant design determinant in barn construction, and again there is a similar need to orientate south-west. Ventilation is integral to understanding such an orientation. At some stage in the processing of harvested grain crops, the useful part of the crop, the grain, is separated from the chaff and the ears from the stems. For barns, ventilation was considered a prerequisite for the purposes of winnowing and controlled ventilation played an important role in which through-barn ventilation (aided by being aligned SW-NE) assisted in the process of separating the grain from the chaff. This practical desire to orientate south-west is an oversight in the functionalist argument if one turns it to Iron Age Scotland and this will be explored later. But what seems to be prevalent in both time and space is the human desire to harmonize the domesticated space with the cosmic order (cf. Bryden 2004: 36; Parker Pearson and Richards 1994: 14-15; Renfrew and Bahn 1996: 381, 385).

The problem, however, is that much of the research into orientation has chiefly been conducted by anthropologists working in the field who are able to witness first-hand the cultural contexts in which they study. As archaeologists, we face a much more difficult challenge. Although the material remains we investigate represent the direct result of human agency (rather than the observations of human agency as in anthropology), those behind that agency have long since died, and the cultures that they were integral within have usually been highly transformed since, with many (if not all) of the connected beliefs that constituted such a culture having been dissolved by time. Prehistory is particularly relevant in this regard, and without informants and without literary sources, all historical and social definitions become problematic.

As noted in the Chapters One and Two, convincing arguments and plausible interpretations of the surviving evidence become the dominant aspect of research in these areas, frequently at the expense of the holistic aspects of human nature, and with clashes often occurring between practical and cosmological interpretations of the evidence presented.

One area where this is clearly relevant regards the study of roundhouse orientation in the British Iron Age, as noted, and the question that is being asked is: as in many traditional societies, did the roundhouses of Iron Age Britain tend to orientate their entrances towards a specific direction and if so, why did they? Practical, cosmological, topographical; all of these possibilities require exploration if we are to define the home.

The Eastern Preference in Iron Age Britain

Regarding the various regions of Iron Age Britain, Guilbert (1975) first analysed roundhouse orientation whilst excavating Moel y Gaer (Flintshire) where the entrance orientation of roundhouses were found to be oriented east and south-east; a theme that would reoccur often in Iron Age studies across Britain. This east/south-east preference, Guilbert (1975: 205) noted, may be demonstrating a cosmological influence that was perhaps attributed to the rising sun; though he also notes that more practical concerns such as protection from the wind and the optimisation of light were probably just as influential. This E/SE pattern was also quite prevalent within individual site reports of the time too; noted generally within a number of synthetic and regional works such as Gates' (1983: 108) study of Northumbrian sites and Knight's (1984: 44) research on Iron Age sites in the Nene and Great Ouse Basins, both of which attributed standardised easterly orientations to be influenced by the direction of the wind.

Later, Wait (1985: 177) too recognised an eastern homogeneity in the orientation of Iron Age shrines and stated that this 'may suggest a degree of sanctity associated with that direction'; concluding further that roundhouses '…may have been similarly oriented to benefit from [this] sacred or propitious direction'. During this time, orientation studies also began to be integrated into theories regarding the social use of space, and the orientation of roundhouses came to be cited as a spatial principle (e.g. Boast and Evans 1986); the entrance marking a distinct boundary that could have held a practical, but also cosmological significance. These earlier works influenced the preparation for more in-depth studies on orientation. Hill's (1988; 1993: 66; 1995b) work within Central and Southern England demonstrated that the entrances of many hillforts and smaller enclosures were oriented towards the east and south-east, and Edwards' (1990: 21; cf. Stout 1984) study on the ring forts of Ireland showed that an easterly orientation was also preferred here.

Recognising and interpreting this trend, Oswald (1991) argued that the phenomenon of easterly and south-easterly doorway orientation was indeed extremely widespread during the Iron Age, both in time and space, further noting that the direction of the east and south-east influenced the entrance orientations of the Irish roundhouses (cf. Edwards 1990), the Scottish brochs (see: Parker Pearson and Sharples 1997), and even Roman courtyard villas in Northern France (also see: Haselgrove 1995). Oswald (1997: 94) later went on to suggest that during the continental Iron Age (and perhaps also the Irish Iron Age), there were clear indications of a pan-European Iron Age sun-cult, manifest in the employment of circular motifs and the wheel in many media and this, he notes, may have extended into Britain (cf. Green 1991), and as such, into Scotland too. It was thus concluded that in the British Iron Age, orientation was predominantly a ritual affair focussed particularly upon sun worship (Oswald 1991; 1997); a statement upheld on the basis that 'there is a strong bi-modal tendency [on the east and south-east], which is repeated with little variation throughout the Iron Age, with only rare local differences' (Oswald 1997: 89).

As noted in the Introduction and within Chapter Two, Pope (2007) later heavily criticised Oswald's work, among others (e.g. Parker Pearson 1999a: 49; Parker Pearson and Sharples 1999b) and argued that Oswald's research unduly extended a model, in which E/SE orientations dominate (along with ideas of sun worship) across Iron Age Britain. I would argue, however, that although Oswald's model should not be extended into all the regions of Iron Age Scotland (see: Crowther 2011), Pope's (2007) distinctly practical conclusions regarding orientation in the Iron Age may gloss over the social significance that can be ascribed to specific cardinal directions, as noted above.

Karl (2008: 71), for example, has suggested that there were links between the importance attributed to orientation in Early Medieval Irish literature and Celtic understandings of orientation. He suggests that from the Irish literature, the word 'east' can mean 'front' or 'ahead', whereas 'west' can mean 'back, rear', with north meaning 'bad, left, inverse, evil' and south, 'right, southerly, pleasant'. Welsh texts too express the same orientation ideology, with left being attributed to the north and the negative, and right with the south and positive, thus suggesting that 'correct' doorways were also orientated towards the east (Karl 2008: 71; Birkhan 1997: 808). Though we should take care extending these to

Iron Age societies in Scotland, these examples do demonstrate how certain directions can accumulate meanings other than mere function.

Despite this however, it is true that many orientation studies on the British Iron Age have seemed to stretch the theory of an easterly preference across Britain without much (if any) consideration of regional difference, individual agency or the role of idiosyncrasy. Faust (2001: 131), for example, has stated that the tendency to orientate east seems 'to exist throughout the British Isles and even in Northern France.'

But regionalism clearly plays a significant part in understanding the British Iron Age, making this period especially complex and multifaceted. With regards to sites belonging to the Scottish Iron Age in particular, the supposed E/SE dominance in Britain (and indeed, across the continent) is somewhat of a fallacy anyway (Crowther 2011). But what these earlier works do suggest is that there was at least a tendency for roundhouses in Britain to be generally orientated towards the east or south-east, and it is this that has influenced the development of the 'cosmological model' over the last decade; i.e. a model that focuses largely on the ritual associations of roundhouse orientation and design rather than concentrating primarily on the practical aspects of orientation and the use of internal space within them. But the question remains, can cosmological inspired models still work as a basis for interpreting domestic architecture in the Scottish Iron Age?

The Cosmological Model: The Home as a Calendar

Earlier house types from the Neolithic period seem to have generally been rectangular (Barclay 1996), and there many well documented examples in Scotland[9]. But from the beginning of the Middle Bronze Age, the apparently

[9] Scottish examples include: Warren Field and Balbridie in the Grampians (Barclay, Brophy and MacGregor 2002; Fairweather and Ralston 1993; Ralston 1982), Balfarg in Fife (Barclay and Russell-White 1993; Barclay 1996; 2002) and Claish in Stirlingshire (Barclay, Brophy and MacGregor 2002; Barclay 2002). In lowland Britain too, there are many rectangular structures dating to the Neolithic including Yarnton, Thames Valley (Hey 2001), Gorhambury, Hertfordshire (Neal, Wardle and Hunn 1990), Etton, Cambridgeshire (Pryor 1988; 2003), Chigborough, Essex (Adkins and Adkins 1991; Brown 1997), White Horse Stone, Kent (OAU 2000; Hayden and Stafford 2006), Stretton-on-Fosse 5, Warwickshire (Gardiner, Haldon and Malam 1980), Padholm Road, Peterborough (Pryor 1974; 2001; 2003), Mill Street, Humberside (Darvill 1996), Gwernvale, Black Mountains (Britnell and Savory 1984), Llandegai 1 and 2, Bangor (Lynch and Musson 2004; Darvill 1996), Lismore Fields 1 and 2, Derbyshire (Garton 1987; 1991),

short lived settlements of the Early Bronze Age are largely replaced by much more substantial roundhouses (Barrett 1994; Parker Pearson and Richards 1994: 47), and from between the Middle to the Late Bronze Age throughout Britain, there appears a flourishing of circular structures, hut circles and roundhouses[10].

What becomes obvious is that during the Iron Age, the circular domestic space becomes predominant, and in Scotland the circular house took many forms; e.g. duns, wheelhouses, crannogs, and brochs, as noted in Chapter Two. During the Scottish Iron Age, domestic rectilinear structures do seem to have been constructed however, and are usually found in association with circular buildings such as brochs and duns (cf. Moore 2003). Examples include Tungadale on Skye (Armit 1996: 131-133), and rectilinear structures found near the entrances at Cnip, West Lewis (Harding and Armit 1990: 92-94; Armit 1996: 131-133), at Crosskirk (Fairhurst 1984: 727-774) and Nybster (Anderson 1901) in Caithness, and also at Howe, Orkney (Ballin-Smith 1994: 97-100). 'Wags', the sub-rectilinear structures of the Late Scottish Iron Age occur mainly in Caithness such as at Wag of Forse (Curle 1944; 1948) and Langwell (Curle 1912), and with many others also to be found in Sutherland, such as Glen Loth, Uppat Wood (Buchanan 2005) and as far away from Caithness as Loch Eriboll in North-Western Sutherland (Mathieson 1925).

Notably, many of these sub-rectangular structures are thought to have been built after the broch period during the Later Scottish Iron Age and may have actually been Pictish in origin (e.g. Armit and Ralston 1997). Indeed, many such

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Hembury (Liddell 1931; Piggott 1954) and Haldon in Devon (Willock 1936; 1937; Piggott 1954; Griffith 1995).

[10] Fitzpatrick et al. (2008) note many such structures which include: Black Patch, Sussex (Drewett 1982), Gwithian (Megaw 1976), Trevisker in Cornwall (ApSimon and Greenfield 1972) and Trethellan Farm, Newquay (Nowakowski 1991); South Lodge in Cranborne Chase (Barrett, Bradley and Green 1991), North Ring, Mucking (Bond and Jones 1988), Shearplace Hill, Dorset (Rahtz and ApSimon 1962; Avery and Close-Brooks 1969), Thorny Down, Wiltshire (Ellison 1987), Stannon Down (Mercer 1970) and Trevisker in Cornwall (ApSimon and Greenfield 1972), Middle Farm, Dorchester (Butterworth and Gibson 2004), Beinn Arncicil, Colonsay (RCAHMS 1984: 130-131), Shaugh Moor enclosure, Dartmoor, (Wainwright and Smith 1980), Cul a'Bhaile, Jura (Stevenson 1984), Brean Down, Somerset (Bell 1990; 1991), Leskernick (Bender et al. 1997), Craddock Moor, Garrow, Stannon on Bodmin Moor (Johnson and Rose 1994), An Sithean on Islay (Barber and Brown 1984), Trewey Foage (Dudley 1941) and Chysauster in West Penwith (Smith 1996).

structures may characterise a move away from a predominantly circular tradition during the Middle Scottish Iron Age towards a sub-rectangular building tradition in the Later Iron Age (Baines 1999: 81; Haselgrove 2003).

But what is obvious, as Fitzpatrick (1997b: 77) and Parker Pearson (1996: 120) also argue, is that from the time of the Middle Bronze Age until the occupation of the Romans, the typical house form in the British Isles was round, and these structures generally faced east. When we also consider that roundhouses were being built in Britain during a time when rectangular houses were being constructed on the continent, this raises the obvious and prevailing question: ‘Why are roundhouses round?’

Although the lack of corners in a round structure has an obvious functional purpose as the circle generally makes better use of space while also deflecting the wind (as noted in Chapter Three), Fitzpatrick (1994: 69-70; 1997b: 77) has suggested that the circularity of the roundhouse may have also been intended to mimic the marking and counting of time, a theme that is often ascribed to earlier structures such as henges, stone circles and round barrows (see: MacKie 1997b; Ruggles 1984; Ruggles and Barclay 2000). He further suggests that the roundhouse, whose shape seems to echo the moon and sun, now fulfilled this role; further interpreting the pattern of E/SE orientations as indicative of a sunwise progression of activities around the circular house; a key argument of the cosmological model.

An analysis of entrance orientations undertaken by Parker Pearson and Richards (1994: 47) in relation to cardinal solar directions, attempts to demonstrate that most roundhouse entrances in the Iron Age faced towards the sunrise of the equinoxes and midwinter, or at least the points between them (though it should be noted that this is the same as meaning the entire E/SE arc anyway). Fitzpatrick (1994) takes a similar approach to the E/SE majority and argues that the roundhouse in general may have acted as a microcosm of the universe, with the passing of time (equinoxes, solstices) being measured around the walls of the house. He created this analogy from evidence gathered from classical ethnographies on France in the Late Iron Age and from Gallo-Roman epigraphic sources (cf. Olmsted 1992), and he goes on to suggest that for many Iron Age societies, years may have been divided into halves (winter and summer) and were defined by the rising and setting sun upon which orientation may have been planned (Fitzpatrick 1997b: 73-74).

This seems to support Parker Pearson and Richards (1994: 47) conclusion that entrances faced toward the sunrise of the solstices or equinoxes. However, Parker Pearson (1996: 120) later took a much more symbolic stance and argued that the commonality of eastern entrances may in fact relate to the sunrise and the daily rebirth of the cycle of light and darkness which revolved around the house, mimicking the revolving daily cycle.

In suggesting that the orientation of easterly facing roundhouses may have been marking the death of night rather than the birth of day, Fitzpatrick (1997b: 77) likewise suggests such an orientation may have helped define the direction of movement around the house which, by association with its rounded rather than rectangular shape, was itself a microcosm of cosmological referents such as the sun, moon, stars and perhaps even being associated with a perception of time itself which was based on the revolving days and seasons. He further makes the point that by orientating towards the rising sun, the rounded architecture of Iron Age dwellings and the orientation of boundaries and thresholds helped to constitute the ways in which people thought of daily routines while further embodying this sense of cyclical time. This marking of time, Fitzpatrick (1997b: 84) argues, would have primarily helped define the agricultural cycle: marking the times to sow crops, breed animals and when also to sacrifice them.

This assumes that Iron Age communities in Scotland based their houses on the seasons and the movements of the sun, and the entry of *direct* sunlight into the house marked a particular time of year. Of course, the home need not act as a calendar. The seasonal appearance of wild plants, the bearing of certain fruit and foliage and the appearance of birds and fish migrating from place to place all mark the arrival of specific times. But the orderly, cyclical recurrence of astronomical phenomena provides a reliable and widely used indicator of the passing seasons, and the orientation of the home would have aided this.

Taking a primarily practical approach to orientation, Pope (2007) guides our attention to Oswald's (1991: 59) statement that in fact relatively few cultures base individual houses on cosmological symbolism. Various studies have, however, discovered that in many traditional societies, cosmological principles fundamentally influence house orientation (e.g. Parker Pearson and Richards 1994: 14-18). I would further stress that this is most apparent in agrarian societies, in which time is often seen as cyclical and is usually attributed to the sun (cf. Eliade 1957); and indeed, it is usually the cycle of the sun that the house is then orientated towards. If we take the Buryat-Mongolians for example, the inner design of the yurt and the placement of domestic objects within it were strongly determined by the passage of time, with children being taught to accurately distinguish different cardinal directions and to recognise the orientation of the yurt with its entrance to the south (Khamaganova 2003).

The cyclical nature of time as especially observed in agrarian cultures is also usually formulated in calendrical systems that can take on an eternal quality. For example, in societies such as the Inca, the sequence of events (i.e. history) did not emerge from a historical marker (e.g. the year), but time instead was seen to unfold in a repeating cycle of months (Goodman-Elgar 2009). In such contexts as these, time is given meaning through calendric knowledge rather than historical knowledge, and calendrical understandings provide a basis for situating everyday activities into a meaningful temporal framework (Bender 2002: 104; Gell 1992b: 299, 308). Individuals or groups who possess that calendrical knowledge may also be seen as the possessors of a source of power that extended into everyday activities and this may have helped sanction their control (Goodman-Elgar 2009: 92), usually over the agricultural cycle which is itself dependent on the ordering of that knowledge.

If the roundhouses (or at least some of the roundhouses) of Iron Age Britain were built in part to act as cosmological calendars that helped mark and define a sense of cyclical time (Fitzpatrick 1997b; Oswald 1997; Parker Pearson 1996), then as Hingley (2005: 102) also points out, this would have aided in defining a series of elements as cyclical (e.g. the day, the year, the human lifespan, the life of the household). Haselgrove (2003) has also stressed that the orientation of the entrance towards the rising sun not only marks the passing of night and of the seasons, but together with the ‘sunwise’ organisation of daily and seasonally referenced activities around the central hearth, these structures mimicked both the diurnal movement of the sun around the southern half of the house, and the unfolding of the annual agricultural cycle.

It is such points as these that have helped refine the development of the cosmological model in the last twenty-five years (and have thus helped define the Iron Age sense of ‘home’), and from the theory that movement within the roundhouse was influenced by the daily and seasonal cycle of the sun, the idea that sun-based belief systems dictated use of space in Iron Age Britain has since flourished.

Generally, the cosmological model dictates that life in the roundhouse is organised around a light and activity-based southern side, with a dark, northern side for sleeping and storage. People would have worked in the south side when the sun was in the southern sky, and would have slept in the north side when the sun was (invisible) in the night sky; and would thus move around the structure in a clockwise (i.e. sunwise) direction (Parker Pearson 1999a). As noted earlier, this was heavily critiqued by Pope (2007). However, I believe that the cosmological model should not be dismissed outright, as certain aspects of the model may hold some truth. The question that needs to be addressed first then is: should we extend not only E/SE orientation assumptions, but also the associated idea of the cosmological model into Iron Age Scotland?

The Cosmological Model and Scotland

The influence of traditional theories of cultural diffusionism means that Scotland has often been seen to lie on the periphery of Iron Age Britain (e.g. MacKie 1965a; 1965b; 1969b; 1971; 1974; Stevenson 1966) and so it is not surprising that orientation studies have extended the E/SE majority into its regions without much (if any) consideration of the Scottish dataset itself (Crowther 2011).

Geographically speaking however, it is Scotland's peripheral position on the British Mainland that makes it most interesting. In the northern latitudes of Orkney for example, there is an obvious contrast between the eighteen hours of sunshine during midsummer and the eighteen of darkness at midwinter. The southern coastline of England on the other hand benefits from 16 hours of daylight in midsummer and 16 hours of darkness in midwinter. The result of this difference is more than just an issue of light availability, as noted at the start of Chapter Two. The physical position of Orkney, at about 59 degrees latitude, also means that the growing season is just 5-6 months long, as opposed to the 7-8 months enjoyed in Southern England (Bond 2003: 105). This is because the high latitude of Orkney means that even during midsummer the sun's angle is nearly ten degrees lower than that in South-West England, thus resulting in lesser quantities of energy from the sun's rays being absorbed into the earth (Berry 1985).

And so, it is the latitude of Northern Scotland and the fact that in summer, sunlight seems so plentiful but in winter seems so absent, and the effect that this has on the agricultural cycle, that suggests to me that rather than a periphery for the cosmological model, northern regions of Scotland – by virtue of their high latitudes and unique lighting conditions – could be investigated as a centre. It should also be noted that original work on the cosmological model focussed particularly on central areas of Southern England (e.g. Fitzpatrick 1997b), however it is the unusually high quality of site preservation in Atlantic Scotland, and especially the survival of human and animal bone deposits of the machair environments of the Outer Hebrides that is increasingly bringing Atlantic Scotland to the forefront of analysis for the cosmological model (Armit 2006: 250). Indeed, the cosmological model has guided the archaeological interpretation of Scottish sites such as the Late Bronze Age-Early Iron Age settlement of Cladh Hallan, South Uist (Ingram, Marshall, Mulville and Parker Pearson 1999). It has also gained an extremely developed form in the interpretation of Dun Vulan broch and wheelhouse, also on South Uist (Parker Pearson 1999; Parker Pearson and Sharples 1999a), and this report will form the focus of discussion here.

Parker Pearson (1996) had previously stated that in the British Iron Age, a number of settlements contained houses that faced west rather than east, however within the Dun Vulan report, Parker Pearson and Sharples (1999b) still used Oswald’s (1997) theory of the existence of a pan-British E/SE majority and specifically integrated it into Scotland’s regions, arguing that the broad pattern of daily activities within roundhouses were generally fixed across Britain; with cooking taking place in the south side of the roundhouse during daylight when the sun is in the south, and sleeping taking place in the north when the sun is in that direction but is no longer visible.

It is by interpreting the entrance orientation of Dun Vulan (easterly facing) in conjunction with depositional patterns around the internal floor space of the broch that they attempt to prove the theory of sunwise movement in the Iron Age, going on to suggest that the cosmological model can even be extended into other regions of Scotland. They also stress a collection of points regarding the model and British Iron Age society in general (1999a: 16):

1. That there is a great significance placed of the sun's path, determining orientation and activities inside the house (cf. Fitzpatrick 1994; Oswald 1991; 1997; Parker Pearson 1996).
2. There is a concentric ordering of activities around the central hearth (Hingley 1990b; Reid 1989).
3. That there is a symbolic/ritual significance placed on structured deposits within pits and other settlement contexts (Parker Pearson 1996).
4. There is a binary division of domestic space between activities such as food preparation and serving (Parker Pearson 1996).
5. There may be a totemic and ritual significance of animal species and portions and their deployment in marking social, temporal and spatial distinctions (Hill 1989; Mulville, Parker Pearson and Sharples 1996).

Parker Pearson and Sharples (1999a: 17) argue one can engage with these conclusions because current thought on the structuring of domestic space in the roundhouse, as well as thought on the cosmological dimensions of architecture in the British Iron Age, has been developed to such an extent that one can now reinterpret Iron Age structures beyond what they refer to as 'prosaic issues of construction, subsistence and chronology' (cf. Fitzpatrick 1994; Hill 1989; Hingley 1990b; McOmish 1996; Oswald 1997; Parker Pearson and Richards 1994; Ingram, Marshall, Mulville and Parker Pearson 1999).

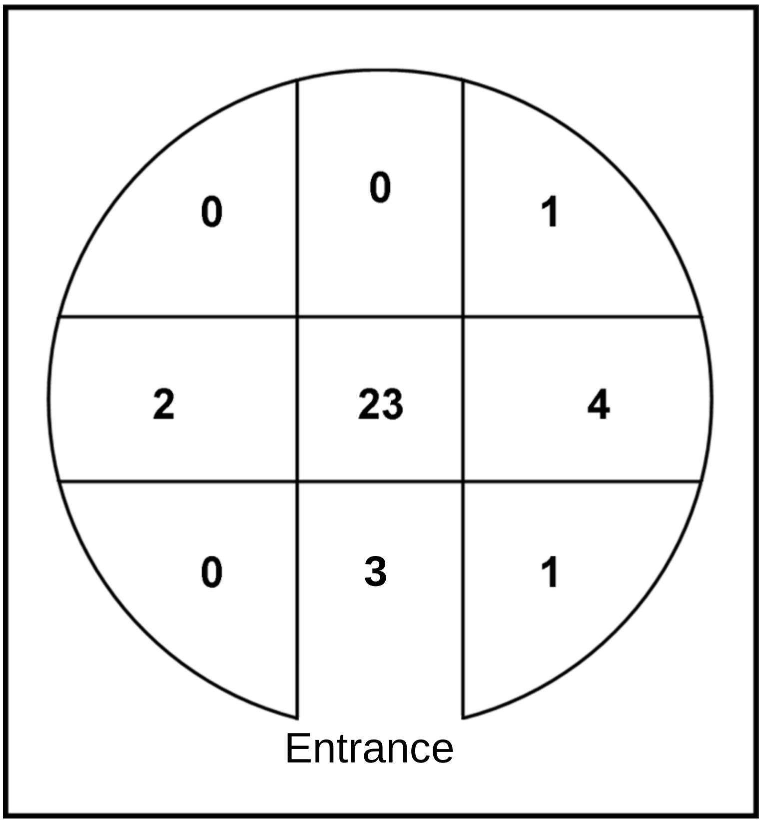
Most significantly however, they utilise Fitzpatrick's (1997b) theory of the roundhouse as calendrical and transform it; suggesting that the home was not only a metaphor for the days and the years, but also of the human life cycle itself – from conception to birth, and from birth to death, with the doorway (facing east towards the rising sun) acting as the possible point at which life symbolically began and ended, with a sunwise progression of life around the interior of the domestic space as mentioned above (Parker Pearson and Sharples 1999a: 21). The question that thus arises in conjunction with the cosmological model is: how were the different cardinal points (the east, the west, the north and the south) influential to the internal (and external) use of space within the Scottish Atlantic Roundhouse and what was the significance of these?

Space and Cosmology in the Iron Age Broch 'Home'

I will begin to answer this by first investigating the space around the hearth, which is a significant area for the investigation of sunwise movement in relation to social arrangement and order. In her calculations of hearth positions from Iron Age roundhouses in Northern Britain, Pope (2007) did not include broch hearths and so I have gathered the surviving information on broch hearths from Canmore and from information held within the inventories collected by MacKie (2002a; 2007a; 2007b) and Hedges (1987a; 1987b; 1987c).

From the 32 sites where hearth positions were noted, I discover that broch hearths were predominantly located in the centre of the broch floor space, with 67.65% of recorded and planned hearth positions to be found here (Figure 4.2). This is a higher percentage than Pope's (2007: 215) study of 279 Iron Age structures from Northern and Central Britain, in which only 42% were found to be central. Another 8.8% of broch hearths are found near the entrance, with very few to be found closer to the back wall of the structure. However, there is an obvious centrality, with 85.29% of hearths found within the central band area (from central left, to central, to the central right-hand side of the broch) in comparison to the 54% in Pope's study (2007: 215).

Figure 4.2. Position of Available Broch Hearths in relation to Entrance.



It should be noted that the general centrality of the hearth may simply demonstrate that in the round courtyard of the broch, there was an obvious requirement for enough seating space around the hearth; and one can assume that space was probably important for customs relating to hospitality too. As Pope (2007: 215) suggests however, hearth centrality may simply reveal the need to create an even distribution of heat and light within the roundhouse, while also reducing the risk of accidental fire. It should be noted, however, that if the structure of the broch was modelled on the circularity of the sun and the cycle of the day/seasons/years, then the centrality of the hearth within that circle – and the even distribution of light throughout the ground floor space – may have also been symbolically linked to those cycles, or, if the cardinal directions were revered for different reasons, then the hearth at the centre may have symbolically represented the centre of the cosmos. In houses where space is divided into the cardinal directions, the hearth can commonly be central, and for many such cultures, the hearth symbolises the centre of the world; e.g. the Atoni (Cunningham 1973), the Tewa (Ortiz 1969) and within the *hogan* of the Navajo (Witherspoon 1977).

Noting the hearth as a place where social hierarchies could also be maintained and established – as is apparent is so many cultures (e.g. Carsten 1995; Lind and Barham 2004) – Parker Pearson and Sharples (1999a: 17) argue that many hearths could probably accommodate between twelve and twenty people at a time; around which they suggest seniority and gender could have been arranged in either a sunwise direction or in a symmetrical way extending from the entrance. The latter they suggest is the most likely given the importance of the east-west axis and special deposits placed in the western end of Dun Vulan. However, it must be noted that though such deposits may reflect a sacred significance being placed upon the west, there may be more practical explanations to be gained. Furthermore, it should be remembered that these deposits may be later than the features discussed in that article, with some hearths perhaps belonging to Late Iron Age or even Early Medieval inhabitants.

Moving onto the social significance that may have been placed on the west however, they note that as it is the domain of sunset, the western end of the roundhouse may have been the most important seating zone within the house because it was from this authoritative position (the western section of the central area facing the fireplace and doorway) that one was supposedly fully orientated. The distinctions between those who faced north and those who faced south across the hearth are argued to have been established by principles of gender, age or kinship.

However, to suggest the west was the most important seating zone because of the 'special deposits' and because of the east/west axis is somewhat assumptive. The south and north sides of Dun Vulan (the south-north distinction) on the other hand are argued to be distinguished between food preparation (south) and sleeping areas (north), as noted; a notion that Parker Pearson and Sharples (1999b) attempt to extend across Scotland (and England) by comparing it to other sites possessing similar floor plans and artefact distributions; e.g. Dunston Park, Thatcham, Berks (Fitzpatrick 1994), Longbridge Deverill Cow Down, Wilts (Hawkes 1994), Bancroft, Milton Keynes (Williams and Zeepvat 1994: 29-32) and Aldclune, Perthshire (Hingley, communication; cited in Parker Pearson and Sharples 1999a: 18).

The same distribution is also noted to be found in the contrast between bare floors (cooking areas) and flagged floors (sleeping area) in northern brochs such as Bu in Orkney (Hedges 1987a), Crosskirk in Caithness (Fairhurst 1984) and Howe, again in Orkney (Ballin-Smith 1994). Extending the sunwise model across Scotland from the Western Isles over to the Northern Mainland and Orkney, they then attempt to support their conclusion by demonstrating that the positioning of quern stones in wheelhouses is revealing in the same way, with eight out of nine thus far discovered having been found in the south side of wheelhouses or in their forecourts. Parker Pearson and Sharples (1999a: 19) go on to interpret the southern half of the house as symbolically and practically bound up not only with the processing and preparation of cereal foods but also with their growth and propagation.

This is an interesting point of discussion however as the south is the location in which the sun is observed at its highest and is thus metaphorically (and in reality) at its most intense and powerful. At noon, as the sun moves into the southern sky, crops within the landscape would (depending on surrounding topography) receive their greatest amount of direct sunlight; and good sunlight (and water) is a natural requirement for the production of a good crop. If the household thus moved around the structure in a sunwise direction, could the processing and preparation of crops and food in the south suggest a symbolic link to the sun at its strongest?

In cultures that arrange their dwellings in a sunwise ordering, the southern sector of the house can be a place where food is prepared, but it is also a direction that can be considered profane; a place where the associations of death and blood intermingle through the preparation of food. At Dun Vulan however, evidence for cereal preparation in the south has been found. And as it can be assumed that when the sun is at its southern apex, cereals in the landscape grow most effectively (and in a way, receive the most of their own nutrition), then the south may have been seen as the location in which it was thought crops took in the light and power of the sun at its most intense.

In Chapter One, I referred to the customs of Amerindian cultures who worshipped the sun as a deity, which included the Kogi of Colombia. The Kogi exposed gold and copper ornaments outdoors to capture sunrays, the power of which was believed to then be granted to priests in subsequent rituals (Reichel-Dolmatoff 1981: 26). So too, the Aztec pochteca merchants laid out their elite and shimmering items to be exposed to the sun, allowing them to be filled with the sacred energy imbued within sunlight (Lépez Austin 1988: 228). A similar custom of 'drawing-in' the sun's power could have existed in Iron Age Scotland; especially when considering their dependence on the sun's energy, as noted.

At Dun Vulan, Barley was the dominant cereal throughout the Middle-Late Iron Age, as it also was in Orkney and Shetland at this time (Bond 2003), with much smaller traces of Emmer Wheat being found (Brayshay 1999: 298). Evidence from other brochs, such as Scalloway in Shetland, suggests that barley may have even been stored in large quantities and formed the main staple of a mixed diet (Holden 1998a: note 28; Smith 1999: 298). And so, it seems likely that barley was the dominant crop throughout the Atlantic Scottish Iron Age, perhaps also providing the main material for roofing thatch; though this may have been supplemented by reeds, heather or oat straw, depending on local availability, as was the case in later periods (Holden 1998b).

Both barley and emmer wheat ripen into a golden coloured product, creating golden landscapes upon which they grow. The symbolic link between a golden crop produce and the power of the sun is well attested in the ethnographic literature on sun worshipping cultures, and this is especially pertinent in relation to the sacred significance of maize and chichi during the later period of the Inca Empire (Goodman-Elgar 2009; also see: Bauer 1996; Goldstein 2003; Jennings 2005; Moore 1989; Silverblatt 1987). Discussing the association between maize production, chichi, and the Inca sun cult, Goodman-Elgar (2009: 85) notes that the fields within which maize grew was thought of as sacred – akin to temples and ritual centres – and they were further associated with the echelons of Inca society.

Hingley (2005: 102; cf. Hingley 1998) has previously suggested that the cyclical nature of daily life in Iron Age society, largely based as it was on agrarian pursuits, would have been complemented with ritual dimensions, and the broch itself may have been thought of as both temple and home. This of course is dependent on how we define ‘temple’ and ‘home’; however, if the home was based around the cycle of the sun, then the fields in which the sun shone daily may have been considered to have a sacred or ritual function; and the broch could thus have marked the area where the produce of the earth and sun could be integrated into the domestic space – with the broch space itself being based on the circle and cyclical nature of the sun, thus giving symbolic meaning to the home.

Ingold (2005; 2007; 2011) argues that landscapes should be seen as ‘weather-worlds’, in which they are perpetually transformed by the personalities of the weather and take on different expressions and characters accordingly. In this way, these landscapes of barley shine brighter and much more golden when the sun is shining down upon them (as opposed to an overcast sky). Although much of Scotland is frequently overcast, when the sun did shine, it would have aided in the creation of golden landscapes. We notice today the stark colour differences that sunshine can make upon a field of barley, wheat, oat or rapeseed, and to us the produce in the fields looks finer in the sun – richer, riper even. And it is this effect of sunlight upon the golden surface of the produce that gives this impression.

For the Maya, it was the ability to grow maize – a sunlight-induced, golden crop – that made maize an elite substance; its successful production demonstrating the ruler’s ability to negotiate with deities and uphold the legitimacy of his reign (Bauer 1996; Hastorf and Johannessen 1994). Likewise, if we consider the broch (Dun Vulan) as a domain where time could be measured against its walls according to the seasons and months, inhabited by people who maintained an estate of land upon which they harvested cereal crops, then the ability to both mark time and grow golden produce could have maintained a sense of power and control, especially if the sun was revered, as is often the case in agrarian societies.

This is a subject that is also briefly alluded to by Thomas (1991: 25; 1996; 2004a; cf. Thomas 2003: 71) in relation to the British Neolithic. He notes that there was an intense concentration of cereal crops around 'special' sites such as causewayed enclosures (Legge 1989: 218), and together with the small group of Neolithic timber houses that have produced extensive caches of grain in Britain and Ireland, such as Balbridie, Lismore Fields and Ballygalley (Simpson 1996; Cooney 1997: 27; cf. Fairweather and Ralston 1993: 316; Garton 1987: 251; 1991), he suggests that archaeologists should perhaps not consider 'timber houses' in terms of farmsteads but should bear in mind whether they actually represent specialised storage areas for a special kind of elite food.

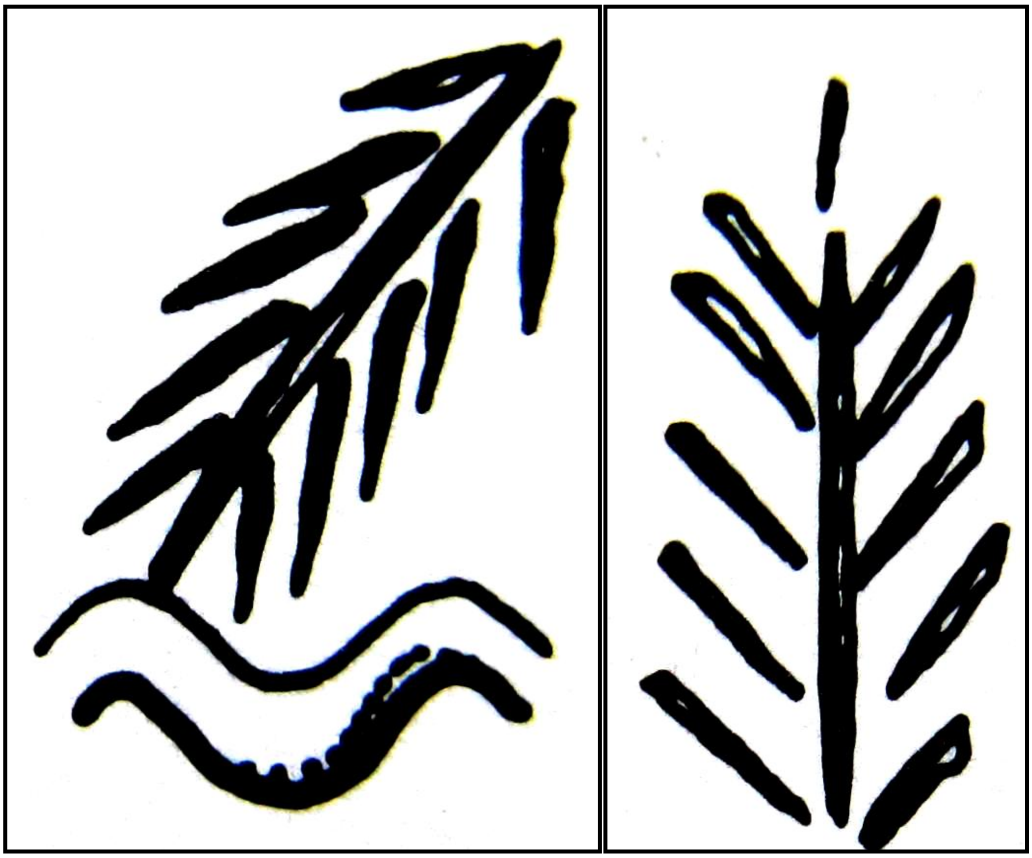
This has been critiqued by Jones and Rowley Conwy (2007) however, and begs the question whether we can extend such ideas into the Iron Age. Yet, the fact that many Early Iron Age communities in Southern Britain stored grain in pits and perhaps used these for occasional feasts – possibly to act as foci for rituals – certainly suggests a communal focus on grain (Hill 1995a; 1995b; Sharples 1991b). This was accompanied later by increased evidence for ritual activity at hillforts around 300 BC, including the structured deposition of animal and human remains in disused storage pits (e.g. Danebury and Maiden Castle; Cunliffe 1992**;** Grant 1984; 1991; Sharples 1991b), and this idea may just as easily be extended to souterrains found beneath many roundhouses in Scotland; features which have been argued to have stored grain (Anderson and Rees 2006: 53-54; Hingley 1992: 35), and may have also held ritualistic associations because of this connection. This suggests not only a ritualistic and sacred significance to grain, but also that grain (and the resulting feasts) served to enhance social bonds and traditions, and so its treatment may have been significant indeed, relating to the hospitality of the host perhaps; an issue to be explored later.

So, if one sticks to a strict adherence to the cosmological model, one may suggest that the south side of Dun Vulan may have been symbolically tied to the outside landscape and the sun, and may in turn have had associations with gender, age and status. And, as the Dun Vulan report suggests, the sun following metaphor could be taken even further in terms of movement into the fields and pastures towards the sun in the morning and similarly facing the sun on the return in the evening (Parker Pearson and Sharples 1999a: 21); and this

Figure 4.3. Ceramic Decorative Motifs from Dun Vulan, originally noted to be 'Feather-Based' but which may actually depict Barley or Grain.

After: Parker Pearson 1999b: 215: Figure 9.2. Combined Decoration, Number 11.

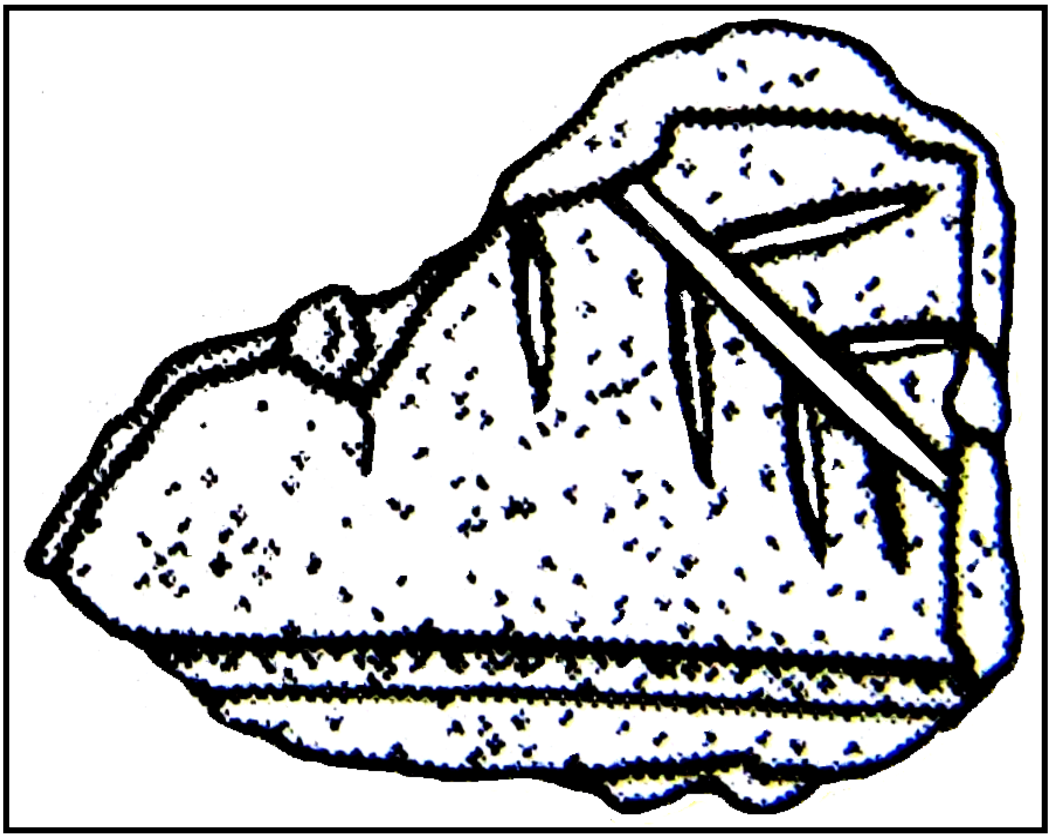
After: Parker Pearson 1999b: 215: Figure 9.2. Incised Decoration, Number 3.



is something that will be investigated in the next chapter by researching the relationship between orientation and light in the landscape.

Parker Pearson and Sharples (1999a: 19) also note however that although inhabitants may have slept in the south side, the distribution of pots, refuse and a peat stack in this southern sector of Dun Vulan refutes this. The high proportion of sherds, smashed pots and food refuse is also high in the southern bays of A'Cheardach Mhor, and at Sollas also, where the distribution of sherds on the floor surfaces similarly indicate that the south-eastern sectors were associated with cooking and storage (Campbell 1991: 155). Parker Pearson and Sharples (1999a: 19) argue that querns (often found in the south), may have played a role in the succession of households, with fragments built into the walls of new houses, often in the vicinity of the doorway; for example at A'Cheardach Mhor (Young and Richards 1960:Figure 4.2). This is an interesting point of discussion because as an obvious boundary, the east facing doorway marked the border in which direct sunlight – an integral and universal element of life and growth – entered at dawn (i.e. the birth of the day). If crops were thought to be saturated with sunlight before being processed in the southern (sunny) half of the house, then those cereals may have been thought to transfer that sun-soaked power not only to those who consumed those resources (i.e. presumably the inhabitants), but also to the material of the querns that were then used to ground the cereals up. This may be one reason why they were then transferred to the doorway, the place where sunlight first entered – the place where the day was born, i.e. a symbolic area of growth in the roundhouse. This is also supported by the ceramic decoration of some fragments from the

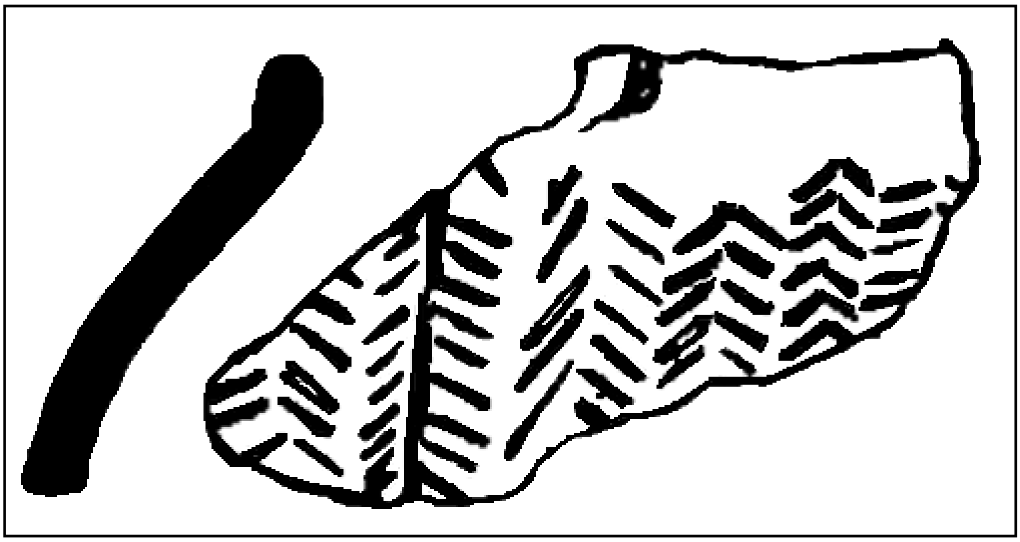
Figure 4.4. Ceramic Decorative Motif from Cnip Wheelhouse (Phase 2) which may depict Barley or Grain.
After: Armit 2006: 117: Illustration 3.8; Image C.



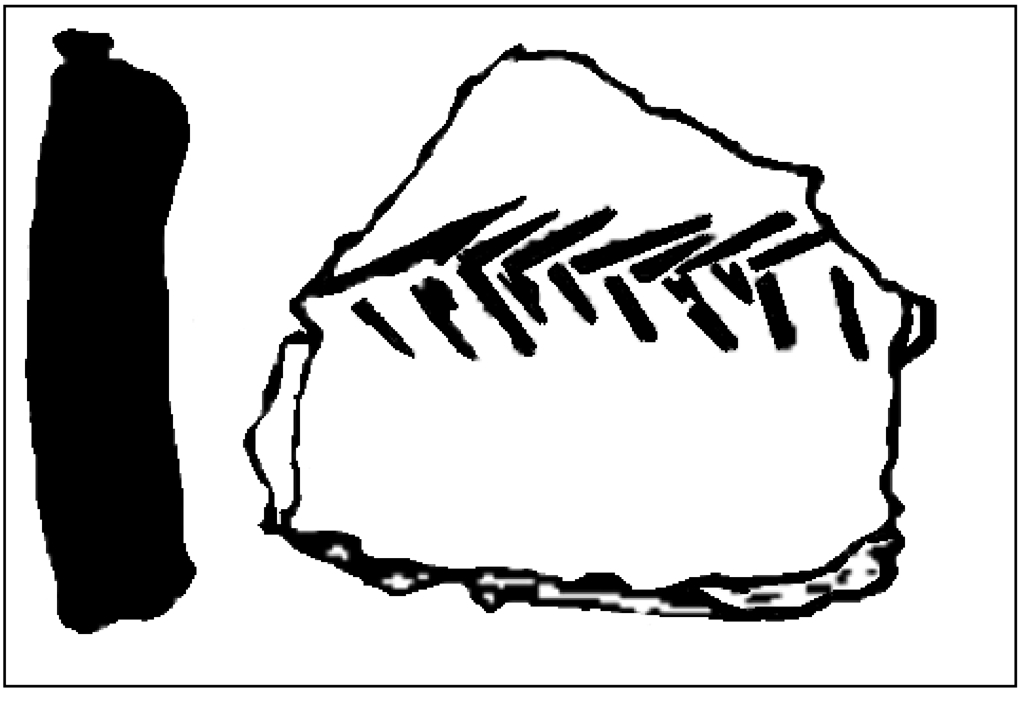
Dun Vulan assemblage and other wheelhouse sites which have hitherto been interpreted to be 'feather-based' (Parker Pearson 1999b: 217), though the motifs seem to instead depict ears of barley, rye or wheat rather than feathers (For Dun Vulan examples, see Figure 4.3; for examples from Cnip, see Figure 4.4; and for examples from A'Cheardach Mhor, see Figure 4.5). As Willis (2007: 119) notes, agriculture was increasingly controlled and centralised in the course of the Iron Age (cf. Hill 1995a), perhaps in response to the change in climate as noted in the previous chapter, and the ear of corn depicted on the gold staters of Cunobelin could also be a symbol of this close association between grain and power/authority (Figure 4.6).

Figure 4.5. Ceramic Decorative Motifs from A'Cheardach Mhor Wheelhouse, South Uist (Phase 1) which may depict Barley or Grain. After: Young and Richards 1960: 144; Fig. 5.

Pottery piece number 6, noted as 'fragment of small pot, the short rim, much abraded in fine red paste decorated with vertical rows of incised herring-bone pattern' (Young and Richards 1960: 160).



Pottery piece number 10, noted as 'fragment in yellow ware with large grits, smooth outer surface, with lightly scratched, uneven herring-bone pattern' (Young and Richards 1960: 161).



The sandy machair which Dun Vulan is built near – and indeed, overlooks – is itself golden, and the fact that many wheelhouses were actually set within this fertile and sandy soil (Dodgshon 1992; Smith 1996), may tentatively suggest that links to the landscape and perhaps even to the power of the sun may have been sought. Interestingly, Parker Pearson and Sharples (1999a: 17) do note that the wheelhouses of Allasdale on Barra, and Clettraval on North Uist, were west facing and were situated on high ground, away from the golden soils of the machair, suggesting perhaps that these structures may have represented a move away from the sun; but other influences (e.g. seasonality) may of course play a part here. However, as Parker Pearson and Sharples (1999a) also note with regards to social distinctions around the hearth space, the west may have been a significant area of the roundhouse, and this raises the question as to the significance of the west. Was the west revered and did western oriented brochs constitute a different type of dwelling to those that faced east?

By first noting Oswald's (1997) statement that E/SE roundhouses face towards

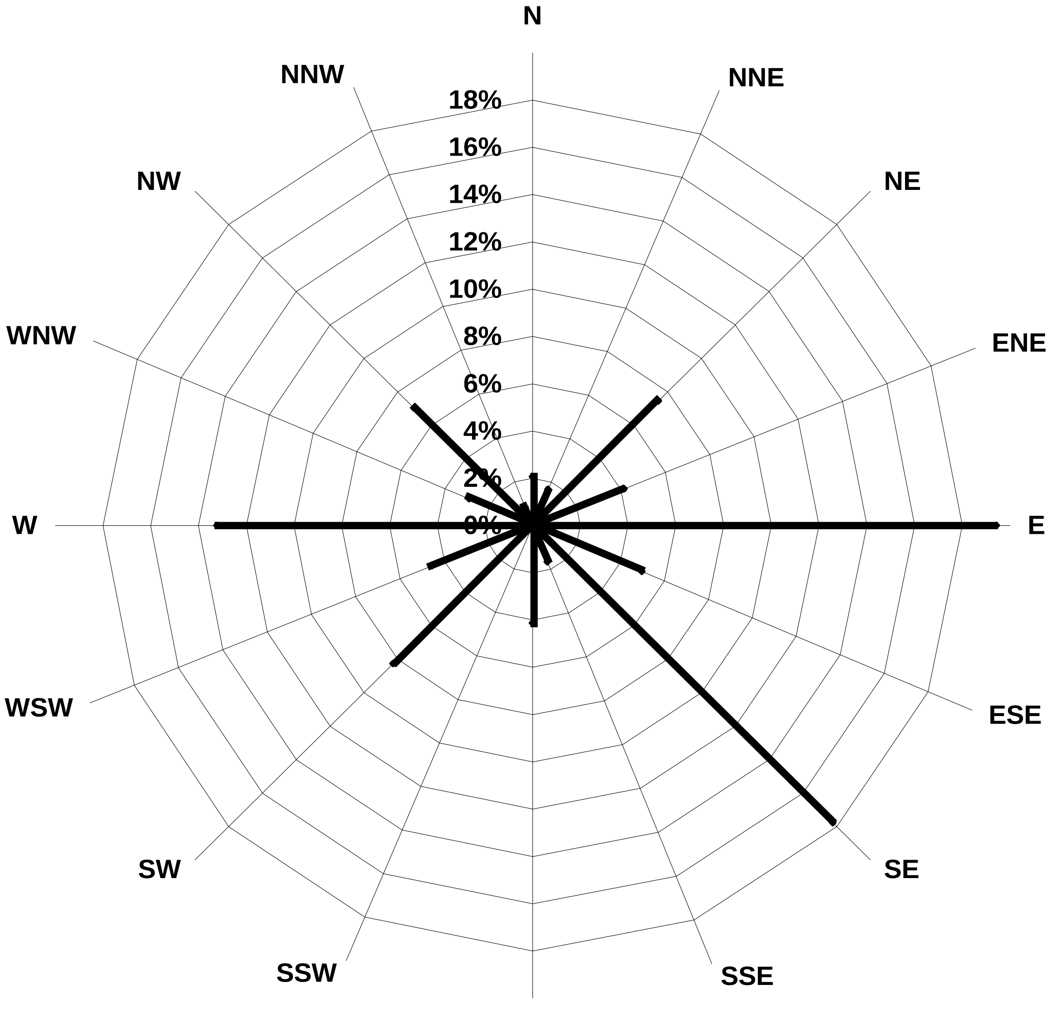
Figure 4.6. Example of an Early Cunobelin Stater.
After: Kretz 2008: 6; Fig. 1; A3.

the equinoctial sunrise as opposed to the midwinter solstice sunrise (the other preferred orientation for British Iron Age houses), Parker Pearson and Sharples (1999a: 17) counter Oswald's statement by noting that half the brochs actually face west (see Parker Pearson, Sharples and Mulville 1996; although in Parker Pearson 1999a: 45, it is noted to be more than half). This is a claim they attempt to corroborate by noting a few wheelhouses that face west (e.g. Cnip on Lewis, Clettraval on North Uist and Allasdale on Barra). Yet if an E/SE majority (and related theories of a sun cult) is held to be dominant across Iron Age Britain (Oswald 1991; 1997), then if one also considers the cosmological model to be a pan-British model, the fact that half the broch dataset faces west certainly proves problematic.

Countering this, Parker Pearson and Sharples (1999a: 17) later suggest that orientation into the west may have been a simple expression of difference from the norm, noting the west facing Allasdale and Clettraval wheelhouses that were constructed on high ground away from the machair as opposed to the east facing wheelhouses that lie upon it, as already noted. Furthermore, they note that within these west facing wheelhouses (Allasdale and Celttraval), the ashy or unpaved areas are to be found located in the north side, indicating that the whole spatial structure was reversed in what they refer to as oppositionally organised dwellings (Scott 1948; Young 1953; cited in Parker Pearson and Sharples 1999a: 19-20)**.** As Armit (2006: 251) later notes, the arrangement of stone furniture in Phase 2a at the western facing wheelhouse at Cnip was channelled anti-sunwise, reversing the pattern as seen in eastern orientated sites such as Sollas and A'Cheardach Bheag. Armit (2006: 251) does, however, bring our attention to the east facing wheelhouse of A'Cheardach Mhor, a site which seems to dictate an anti-sunwise progression around the interior (Young and Richards 1960: fig. 2).

Parker Pearson and Sharples (1999a: 17) do note, however, that in the case of brochs, the construction of western facing brochs seemed to require a considerably larger labour force and construction time (most evident at brochs such as Midhowe, Orkney; and Mousa, Shetland) and may be marking differences in social rank. It may be that the west was significant then (an idea to be explored further in Chapters Five and Seven), and to support this theory, they suggest that at Cnip, its western orientation may have related to its status as a specialist metalworking site (Armit and Dunwell 1992); though it should be

Figure 4.7. Entrance Orientation Pattern for the Brochs across all of Scotland.



Cardinal Point	No. of Brochs
N	5
NNE	4
NE	18
ENE	10
E	47
ESE	12
SE	43
SSE	4
S	10
SSW	0
SW	20
WSW	11
W	32
WNW	7
NW	17
NNW	2

noted that Armit (2006: 250) later explains that there is in fact nothing from the excavations at the wheelhouse complex itself to suggest that the inhabitants were specialist metalworkers.

Aside from this, Pope (2007: 212) notes that of the 90 brochs inspected by Parker Pearson, Sharples and Mulville (1996), just 32% of that dataset face west. From my own calculations of 242 brochs across Scotland (Figure 4.7), only 13.22% (32) of the broch dataset actually faces due west, but if we then consider the entire western arc in general from the SSW through to due W to the NNW, one does find that a large portion (36.78%; 89 sites) of broch orientations lie within it; a fact that is still in opposition to the 57.02% (138) of brochs to be found within the entire eastern arc (SSE-E-NNE).

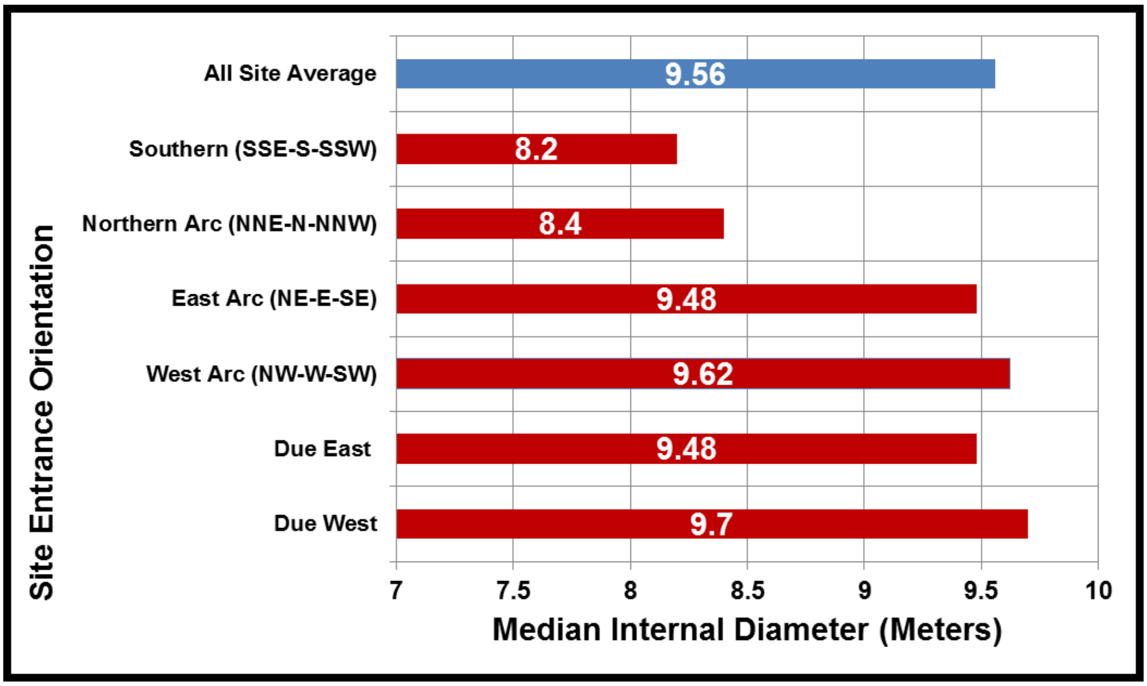
However, though this is by no means half the broch dataset, when we consider practical explanations, such as the Pope's light/shelter optimum (2007) – something that has also been expressed by Boast and Evans (1986) – then the percentage of brochs that we find orientated westwards is surely large enough to prevent one from merely considering western oriented brochs as marginal and thus not worthy of consideration. Oswald's (1997: 91) statement of a 'small but significant minority' of roundhouses with west facing doorways is not viable with regards to the brochs, and although only 13.22% (32) of brochs face due west, only 19.42% (47) face due east, which hardly makes due-east a majority. West facing structures should not be ignored as a distinct set then, and I wish to refer back to the point that Parker Pearson and Sharples (1999a: 17) make: that west facing roundhouses required a 'considerably larger labour force' and ask the question, did west facing brochs differ dimensionally from their east facing counterparts, and if they did, why?

Orientation and Dimensional Differences between the East and West

With regards to the dimensional measurements of the brochs, there are numerous sources of data that I have collected for analysis. Data was mainly collected from Canmore within the Royal Commission on Ancient and Historical Monuments of Scotland database inventories, but data was also collected from sources utilised by MacKie in his set of inventories which detail much of the existing information on the structural features of individual brochs, wheelhouses and other forms of Atlantic Roundhouse across Scotland (MacKie 2002a; 2007a; 2007b).

The selected dimensional records include internal, external and overall diameter, wall thickness, and wall base percentage. First, I shall analyse the internal measurements, taken from the widest section of the central court of broch structures. Comparing measurements taken from sites orientated within

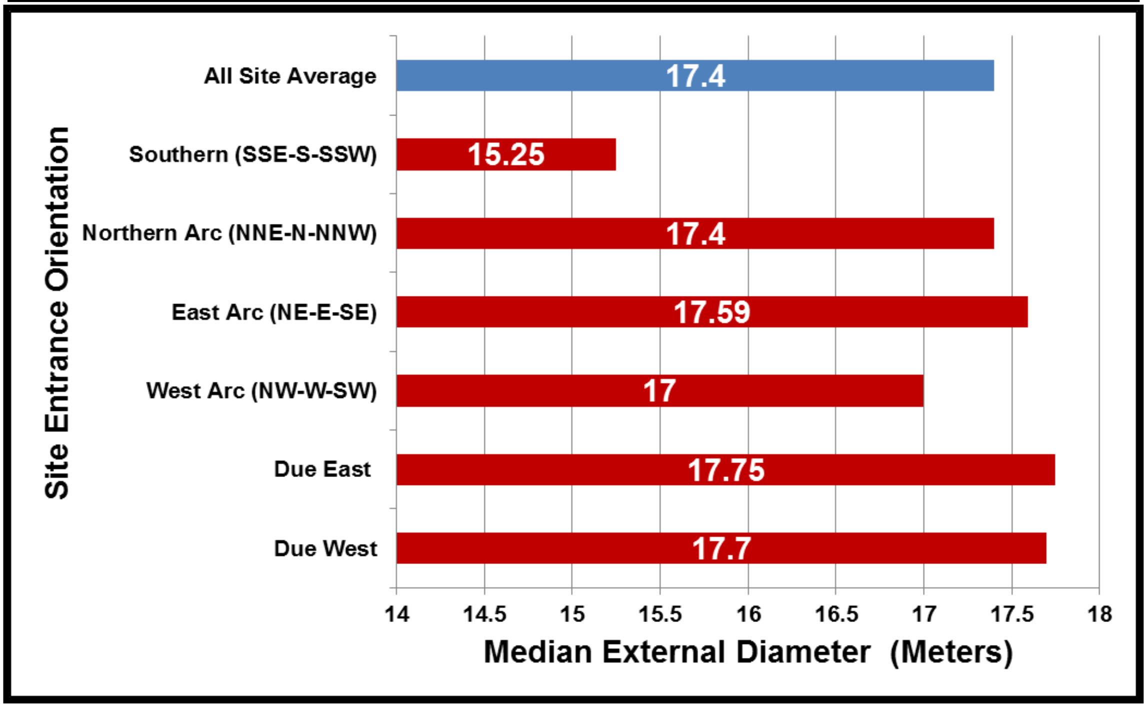
Figure 4.8. Median Internal Diameter Measurements



the eastern arc between SE-E-NE (53 recorded sites) and the western arc between SW-W-NW (38 sites), we see that the internal measurements of western oriented sites exceed the average median of all sites regardless of orientation, but also exceeds the average eastern measurement (Figure 4.8); though this difference does appear to be somewhat marginal. The difference between due east (19 sites) and due west (16 sites) is clearer but still marginal, with only a 14cm difference between them. Out of the overall number of sites, regardless of whether the entrance had been distinguished or not, there were 117 internal measurements, out of which only five were found from sites facing southwards (within the SSW-S-SSE arc) and another six from those that are northern (NNW-N-NNE) oriented. Considering the small number of sites orientated towards these two directions, it is difficult to distinguish whether the lower median averages from northern and southern oriented sites demonstrate that such dwellings were intended to be smaller.

With regards to the overall diameter of structures, certain surveyors seem to have used the term ‘external diameter’, while others use the term ‘overall diameter’. For the sake of accurate comparison, I have split these two types of

Figure 4.9. Median External Diameter Measurements



measurement into separate graphs so as to best judge. There are fewer recorded ‘external measurements’ (77 sites altogether). But still, the difference between due east (11 sites) and west (4 sites) is extremely marginal (a 5cm difference), though sites orientated in the eastern arc (36 sites) would seem to possess a slightly larger diameter range than those oriented in the western (25

Figure 4.10. Median Overall Diameter Measurements

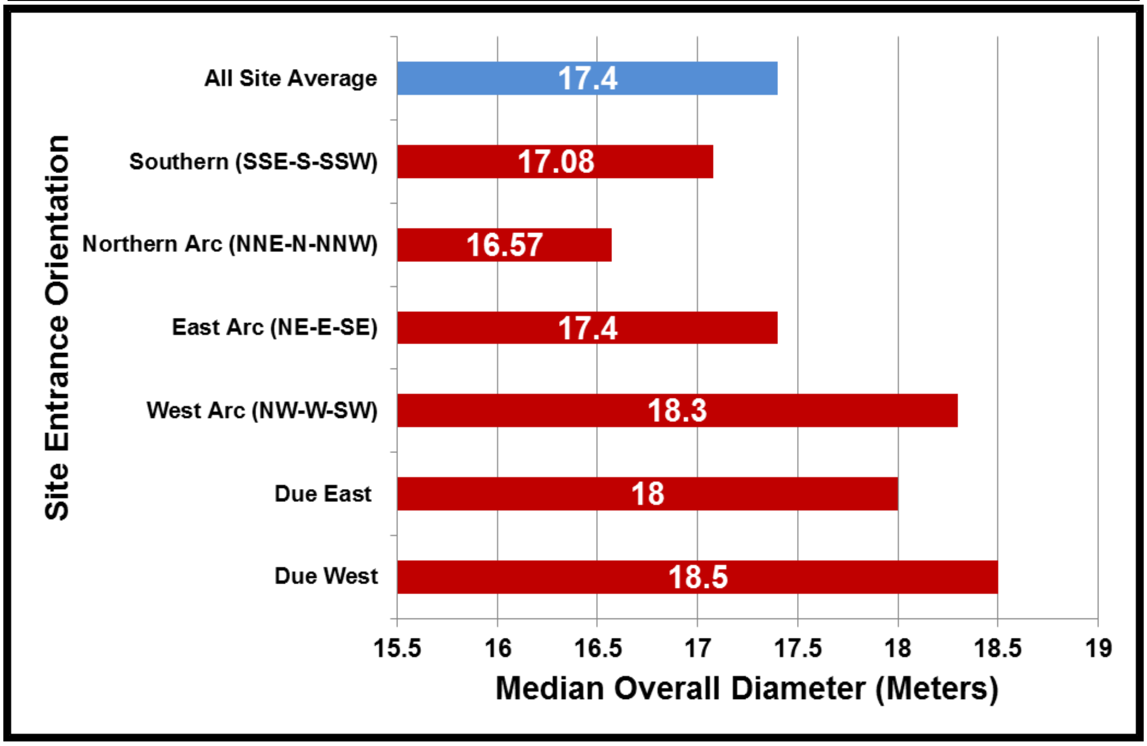
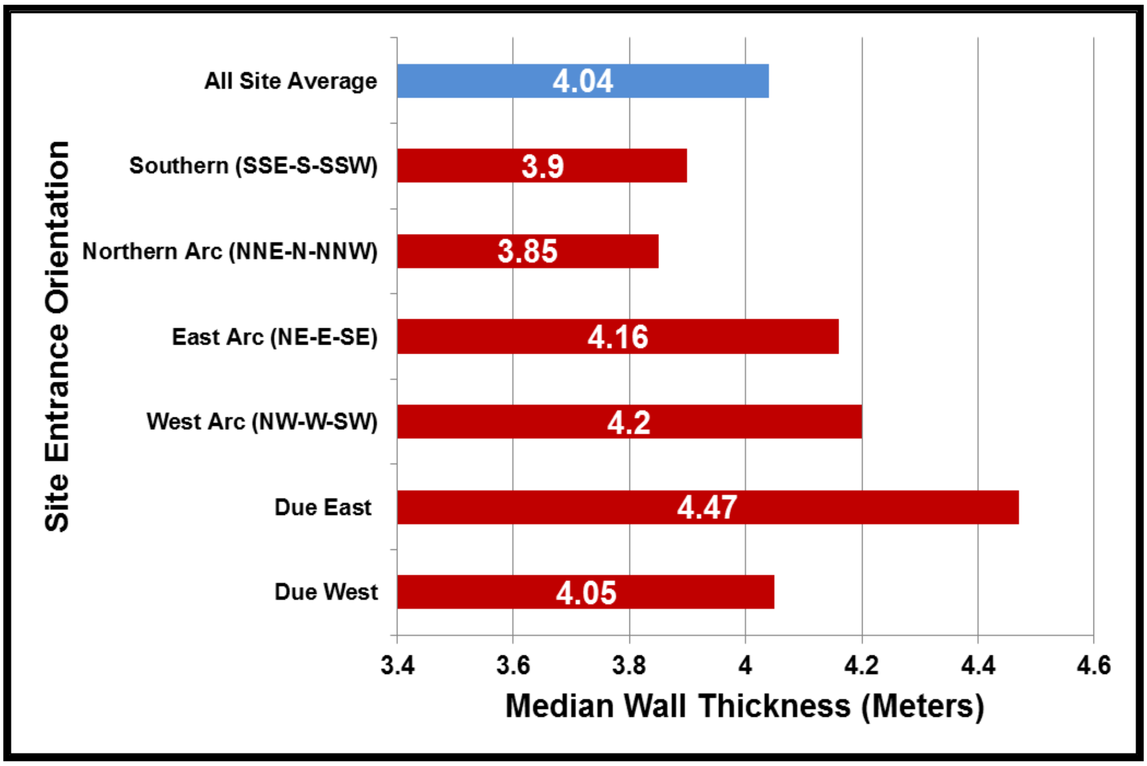


Figure 4.11. Median Broch Wall Thickness



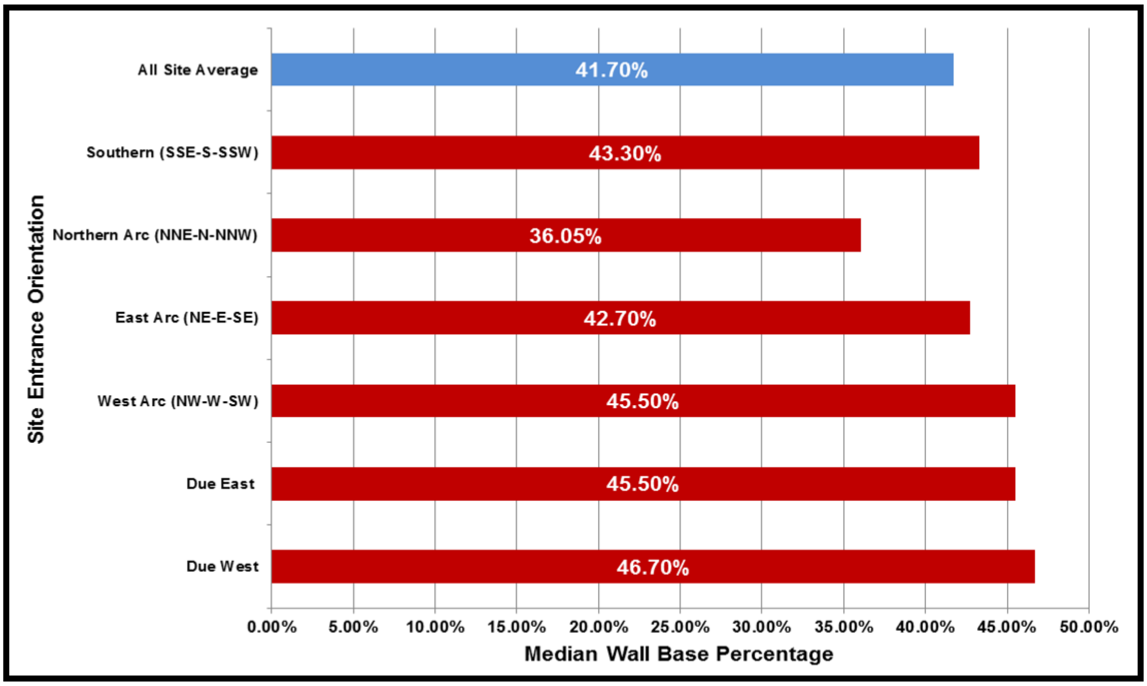
sites) based on external diameter alone (Figure 4.9). Again, there are marginal differences between the north (3 sites) the east and west, though south oriented sites (3 sites) do seem to differ quite markedly; but this is due to the small number of sites and the fact that the southern oriented Knowe of Burrian broch on Orkney is much smaller when compared to its other south facing counterparts.

There are slightly more records that detail ‘overall diameter’ (83 sites; Figure 4.10) which, along with the wall base percentage, can best judge the size of a broch structure in its entirety. Sites facing due west (4 sites) do seem to be larger than due east (11 sites), but not markedly so with a 50cm difference between them. The difference between the eastern arc (27 sites) and the western (13 sites) is clearer however, and with nearly a meter’s variance between them, western oriented sites would indeed appear to be somewhat larger. Northern (4 sites) and southern (3 sites) oriented brochs again appear below the average, with the north obviously being so at 16.57 meters, though again this is largely due to the small number of sites recorded and the fact that the overall diameter of one north facing broch (Ferry Wood broch in Sutherland) is only 14m, without which the median would be 16.98m.

With regards to wall thickness, 249 broch records within the Canmore database and within MacKie’s inventories (2002a; 2007a, 2007b) were taken (Figure

4.11). The records of 183 of these sites also note the entrance orientation and from these, brochs facing due west (24 sites) seem to be possess thinner walls in comparison to brochs facing due east (31 sites), which is curious because one would expect a west facing site – which is more exposed to the elements than an east facing dwelling (depending on latitude and position of the site in the landscape) – to possess thicker walls to compensate for the loss of heat. The difference between western (71 sites) and eastern (92 sites) oriented sites is not so marked, and again the northern (10 sites) and southern (10 sites) facing sites are markedly thinner; something which may suggest that these structures had a different function to sites oriented elsewhere.

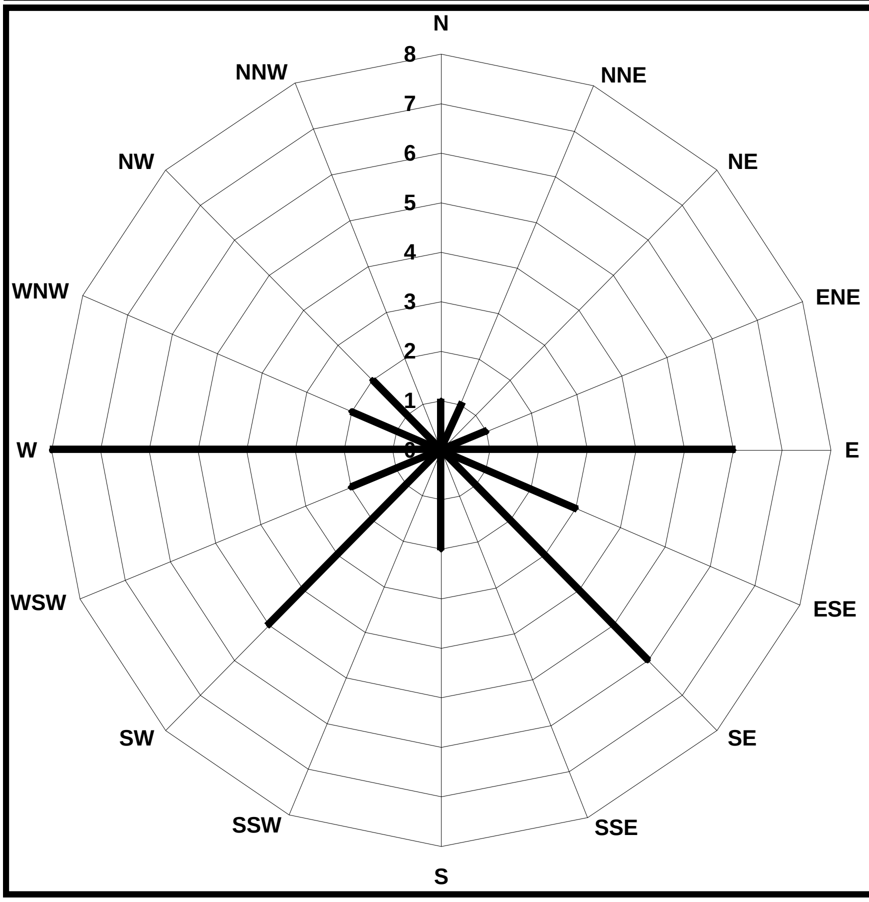
Figure 4.12. Median Wall Base Percentage Measurements



With regards to wall base percentages (WBP), there were a great number of sites (214) which had existent measurements, with a median wall base percentage of 41.7%; though entrance orientations had not been recorded for all those sites (Figure 4.12). Sites that face due west (23 sites) and due east (27 sites) markedly stand above the overall average. There is a difference of 1.2% between due west and due east WBPs, with west facing sites possessing larger WBPs, assumedly to hold higher walls; and this is perhaps best exemplified at the west facing broch of Mousa on Shetland. Often cited as a ‘typical broch’ (e.g. Bell and Hedges 1980), Mousa in fact possesses the largest wall base percentage of them all at 64.5% (see Fojut 1982a), well above the average. The difference between the western arc (64 sites) and the eastern arc (80 sites) is evident however, with the WBPs of western oriented sites being 2.8% higher than those facing east, which in terms of wall base percentage, can be considered as slightly more than marginal. Southern oriented sites (9 sites) are also marginally lower, but still higher than the average, and although the northern arc (6 sites) clearly appears lower, it should be noted that out of the few northern orientated sites, the NNE facing Nybster broch in Caithness is second only to Mousa, with a wall base percentage of 60% - 18.3% above the overall average. With regards to a significant difference in labour, western facing brochs would thus seem to possess the means of building taller, and larger broch structures.

But what of the orientations of the largest wall base percentages? Out of the 159 brochs with orientation and available WBP data, 80 (50.3% of the entire set) are oriented in the eastern arc (SE-E-NE), with another 64 (40.2% of the

Figure 4.13. Orientation of Brochs with a Wall Base Percentage over 50%.



Cardinal Point	No. of Brochs
N	1
NNE	1
NE	0
ENE	1
E	6
ESE	3
SE	6
SSE	0
S	2
SSW	0
SW	5
WSW	2
W	8
WNW	2
NW	2
NNW	0

set) recorded from structures oriented in the western arc (SW-W-NW). This difference is due to the fact that there are simply many more brochs orientated within the eastern arc than the west. Yet even though there is over a 10% variance in the number of available records between eastern and western facing sites, there are still more sites with a WBP over 50% to be found oriented within the western arc (Figure 4.13). Indeed, out of the 159 available WBPs, only 39 possess a WBP over 50%, which is well above the median WBP at 41.7%. Still though, 41% of brochs within this high WBP set are oriented within the eastern arc (SE-E-NE) in comparison to the 48.7% from brochs oriented within the western arc (SW-W-NW). Even when we extend this analysis to include sites oriented within the entire western arc (SSW-W-NNW) and the entire eastern arc (SSE-E-NNE), the westerly majority remains, with 48.7% being western oriented sites comparable to 43.5% recorded from eastern oriented sites. Sites facing due west are also in the majority, making up 20.5% of the set of WBPs over 50% in contrast to the 15.3% of those facing due east.

Furthermore, out of the western (SW-W-NW) orientated sites with available orientations and WBPs, 29.6% possess a WBP over 50% in comparison to the 20% of eastern (SE-E-NE) facing sites with the same available records. We can thus conclude that western oriented brochs tended, but did not predominantly, possess the dimensions for larger and higher structures than those oriented eastwards. Many western oriented brochs would thus be assumed to have required a higher labour force to construct, as Parker Pearson and Sharples (1999a: 17) originally argued. According to the cosmological model, this may suggest a special focus for these sites, with western facing brochs perhaps being considered significant (Armit 2003: 64), assumingly opposing the eastern facing brochs and perhaps even linked to ideas relating to the setting sun which the west engenders.

Though western facing sites may have been distinct in some way, and possibly even represented a negotiation with the ‘Other’ – as to be explained and explored in depth within later chapters – I would be hesitant to suggest that they acted as binary opposites to eastern facing brochs however, with an anti-sunwise movement being performed within them (Armit 2006). Even for western facing ‘anti-sunwise’ brochs, certain architectural ‘rules’ still applied which counter a strict adherence to the cosmological model. Though these may have related to cosmology (originally, at least), I think it more likely that they held associations with other themes associated with the maintenance of the ‘home’, as noted at the beginning, such as acceptance, hospitality, respect and notions of insider/outsider; a feature which probably existed regardless of doorway orientation.

The Rules of Movement in the Home: Hospitality, Tradition or Cosmology?

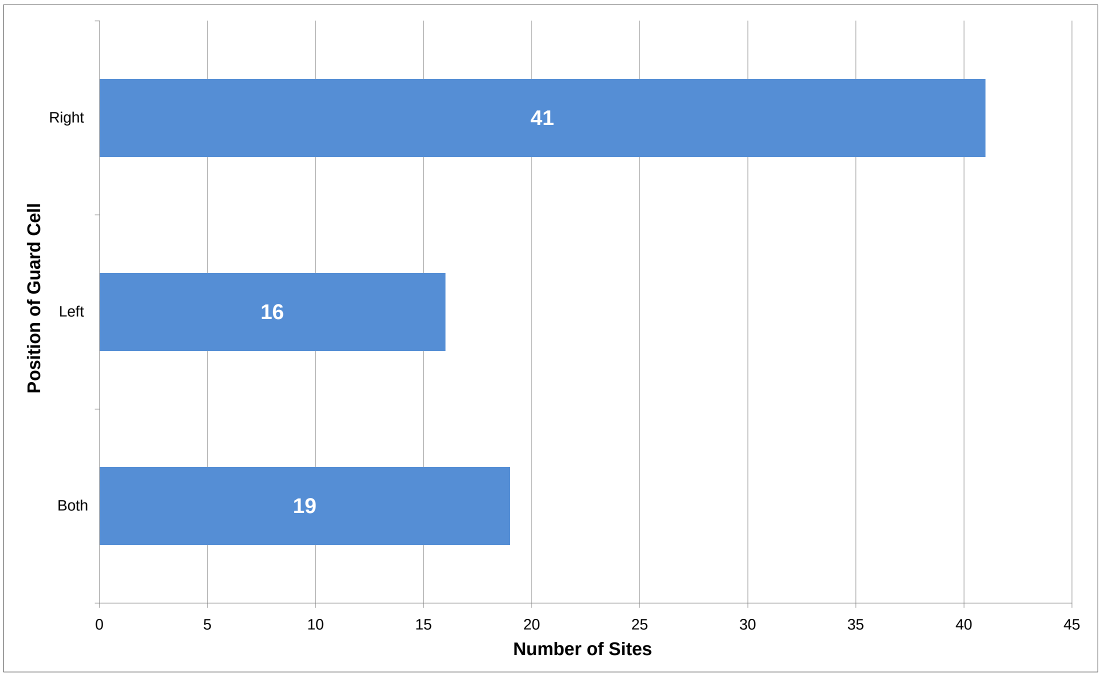
As noted by Karl (2008: 71), there appears to have been links between the importance attributed to orientation in Early Medieval Irish literature and Iron Age understandings of orientation. Early Medieval Irish literature demonstrates that the word ‘east’ can mean ‘front’ or ‘ahead’ (suggesting that ‘correct’ doorways were also orientated towards the east), whereas ‘west’ can mean ‘back, rear’. The word ‘south’, can mean ‘southerly’, ‘pleasant’ or ‘right’, whereas ‘north’ is associated with words such as ‘bad’, ‘evil’, ‘inverse’ and most importantly, ‘left’ (cf. Birkhan 1997: 808).

Of course, we should take care extending these to Iron Age societies in Scotland, but it is interesting that not only is there an obvious aversion of north facing doorways across Scotland (3.1% of broch orientations; Crowther 2011: 53), but also, that there seems to have been a similar aversion or avoidance of the ‘left’, and a focus towards that which was ‘right’ within brochs, regardless of whether the broch faced east or west.

We see this in broch hearths for example. When they are not wholly central, they are generally located in the right-hand side of the roundhouse (from the perspective of the entrance) with 17.64% of available records located in this area (refer back to Figure 4.2). This is in juxtaposition to the 5.88% located on the left-hand side of the broch, and this may suggest some form of avoidance of the left-hand side of the entrance. This preference for the positioning of hearths on the right-hand side may be witnessed in Pope’s study (2007: 215) of central and northern British roundhouses, with 21% of hearths found on the right of the entrance in admittingly marginal opposition to the 18% located on the left in that study. Though this is a very small difference, it may still hint to a social protocol which favoured the right over the left however.

With regards to Early Medieval Irish sources, Karl (2008: 71) notes that for the Celtic Irish, approaching a place or person with the left side facing towards the approached was seen as a threatening gesture and an expression of ill intent. He notes that this can be seen in passages from the Tain Bo Cualnge, in which the boy CuChulainn, the main hero of the tale, returns to Emain Macha with the left side of his chariot facing the fort, causing major panic (Kinsella 1969: 91-92). Though comparisons between contexts and periods should to be taken with caution, a negative association with the left in the Scottish Iron Age may also relate to the predominance of so-called ‘guard cells’ being found on the right-hand side of broch entrance passages (from the perspective of someone entering the broch from the outside) rather than the left (Figure 4.14). This would seem to counter the often quoted theory that these were defensive features (see: Armit 2003: 64-66; Crawford 2002: 122; Dodgshon 1981; Hingley 1992: 14) because, as the majority of people are right handed (between 70-90% of the current global population; Holder 1997; Hardyck and Petrinovich 1977), someone with a weapon would likely enter the broch holding it in their right hand. Therefore, their right side (i.e. their sword-side) was defended from attack from the right. So, if they were used in defence, ‘guard cells’ should be on the left of the entrance (as viewed from the outside) as any attacker would be more exposed.

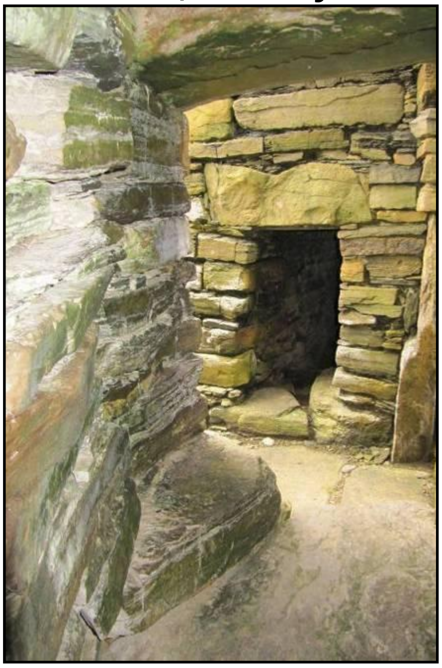
Figure 4.14. Location of Available ‘Guard-Cells’ within Broch Entrances.



Guard cells also tend to possess narrow, small doorways, and certainly do not appear to be large enough to strike someone in the entrance passage with ease, with visited examples including the guard cells at Mid Howe on Rousay, Gurness on Mainland Orkney, and Carn Liath in Sutherland (Figure 4.15). The defensive interpretation is also flawed due to the existence of a few rare examples in which guard cells are apparently set outside the door checks within the entrance passage (Armit 2003: 64). Their purpose is thus somewhat of a mystery, though if the right was associated with that which was ‘good’ and approachable, then it is conceivable that they were used as part of a ritual of acceptance into the home, with the entrance being particular important in this regard.

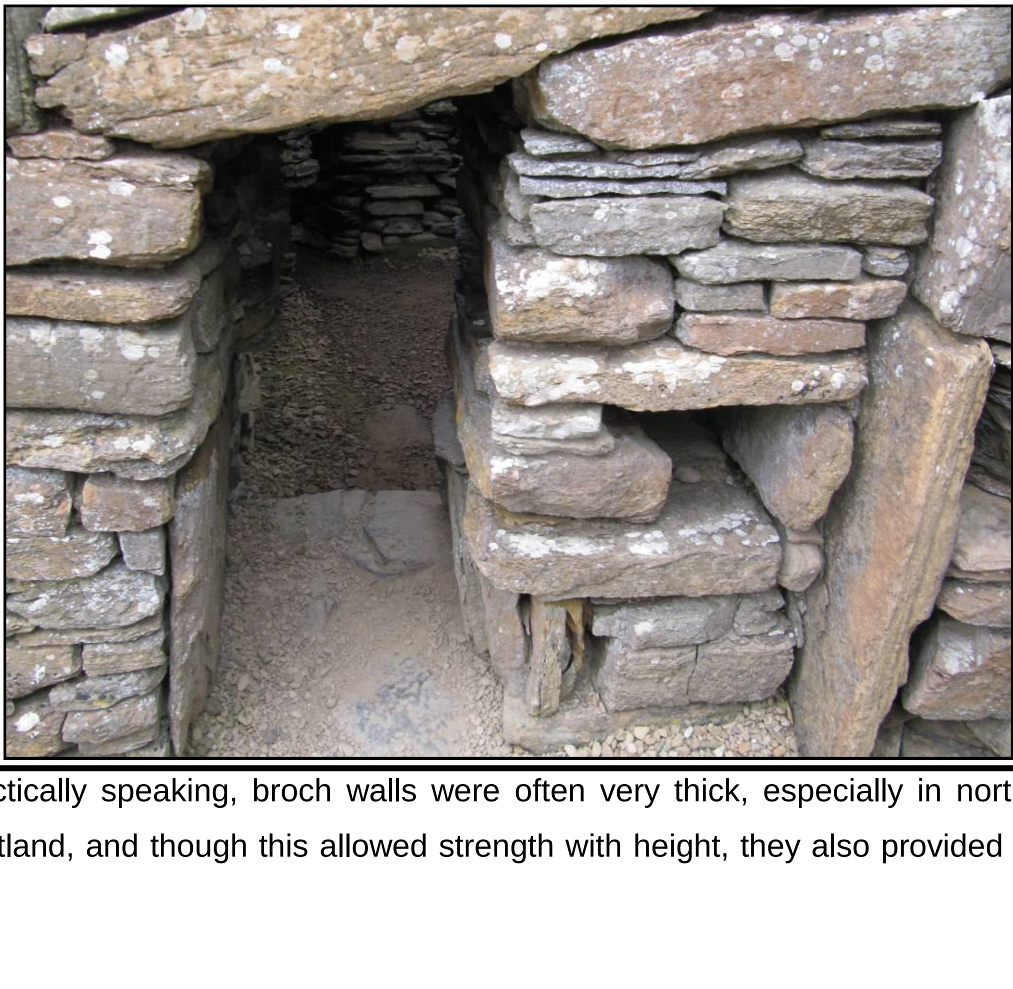
Figure 4.15. Guard Cell Comparisons. *Author's Photographs.*

Midhowe, Rousay



Carn Liath, Sutherland

Gurness, Mainland Orkney



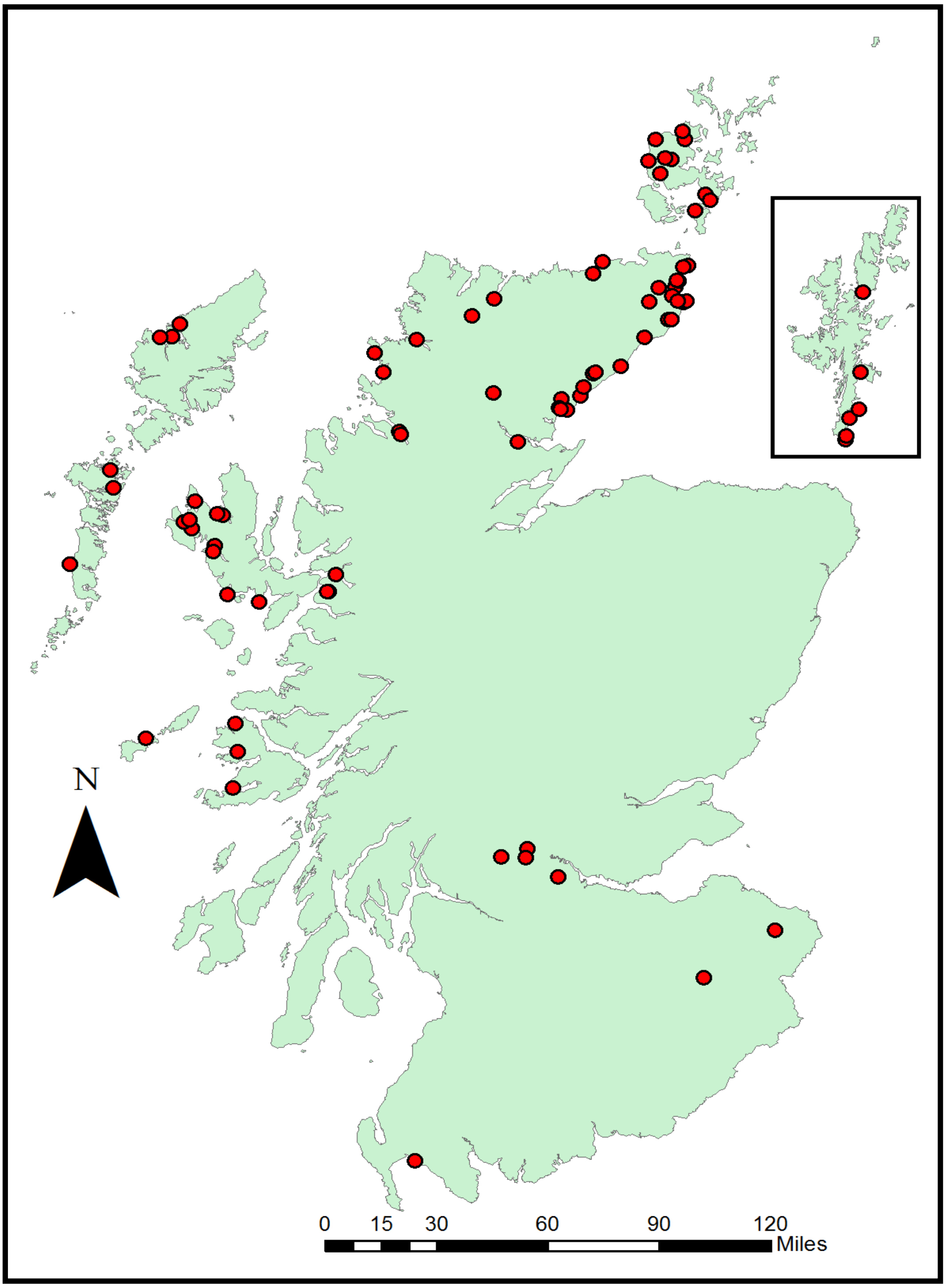
Practically speaking, broch walls were often very thick, especially in northern Scotland, and though this allowed strength with height, they also provided long recessed entrance passages that heighten the sense of transition from outside to inside and accentuate the sense of space within the building. The strong and dominant doorway of the broch, with its long entrance passage, emphasises the entrance as a powerful boundary, and boundaries, such as doorways, usually represent and maintain certain values (Douglas 1966). In particular, the distinction between the inside and the outside is particularly salient among many cultures, and this can relate not only to physical spaces, but also to psychosocial values. For example, within many cultures, the inside is often associated with purity, cleanliness, safety, and intimacy (inside the group as well as inside a physical space), and the outside is associated with impurity, dirt, danger, and strangeness (see: Hendry 1992; 1995; Ohnuki-Tierney, 1984). With this in mind, guard cells may not represent a defensive feature at all, as is often argued, but may have been part of a ritual of purity and acceptance into the home (for a comparison with hillfort ‘guard-chambers’, see: Bowden 2006: 432).

For the Japanese, cupboards in which shoes can be kept are located near the entrances of houses (shoes representing the outside, impurity and dirt). Indeed, in the recent past, every house, large or small, had a vestibule where one would take one's shoes off before climbing the few steps to the floor level (Morse 1972; Nakagawa 1985). Located in the long entrance passage – between the doorway and the interior space – the guard cell, often on what one may assume to be the socially accepted right-hand side of the entrance – could have represented the area between the outside and the inside; between what could have been considered clean and what was dirty. In this way, the ‘guard cell’ could have been a way of making a clear distinction between inside and outside; in which certain outsiders or objects (e.g. weapons/cloaks) could have remained, thereby keeping the inside, and insiders, clean; and the approach to this space was often on the right, perhaps suggestive that approaching on the ‘right’ was part of a code of hospitality and respect. Guard cells are sometimes found on the left however, and though this may allude to social distinctions between what was placed within those which were on the left and right, it means that guard cells can only represent a *tendency* to avoid the ‘left’.

An aversion of the ‘left’ appears to be most clearly seen however in the almost universal rightways/clockwise ascension of broch intra-mural staircases. Indeed, 76 brochs still possess surviving intramural staircases across Scotland

(Figure 4.16), and all but one of these sites (i.e. Dun Grugaig, Skye) possess staircases that ascend in a clockwise/rightways – that is a sunwise – direction. 98.18% of all available intramural staircases thus ascend in this way. This would have meant that as one entered the stair-foot cell within the broch wall, one had to then turn right and continue to ascend the intra-mural stairs in that direction (clockwise) around the structure.

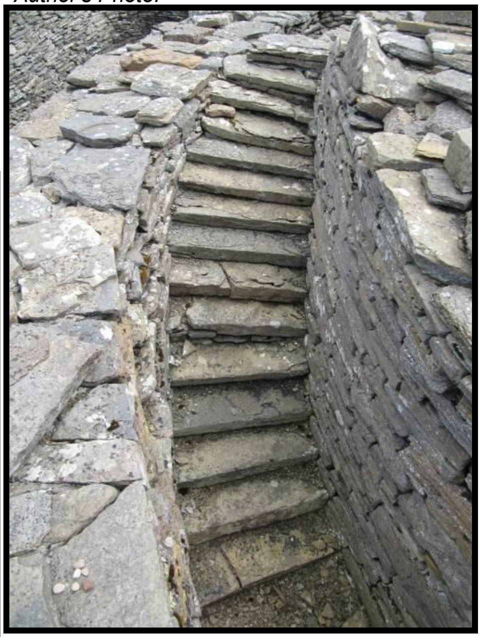
Figure 4.16. Sites with Surviving Intra-Mural Staircases throughout Scotland.



At first glance, one could assume that like the staircases within Medieval towers, there was a defensive purpose to this clockwise ascent, as those ascending the stairs would seem to have been somewhat disadvantaged,

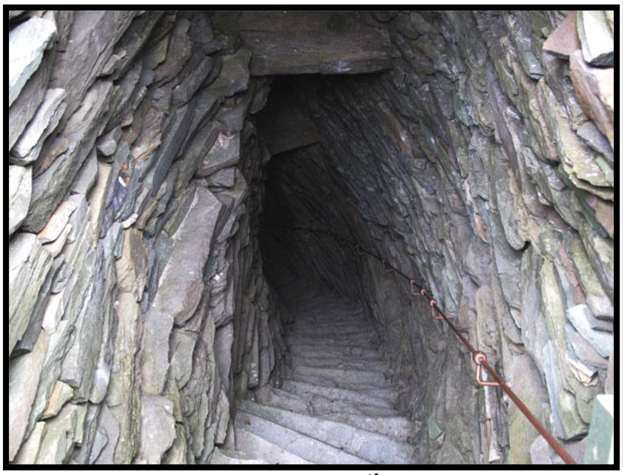
Figure 4.17. Comparison of Staircases .

Mid Howe Broch, Rousay.
Author's Photo.



Mousa Broch, Shetland.

Author's Photo.

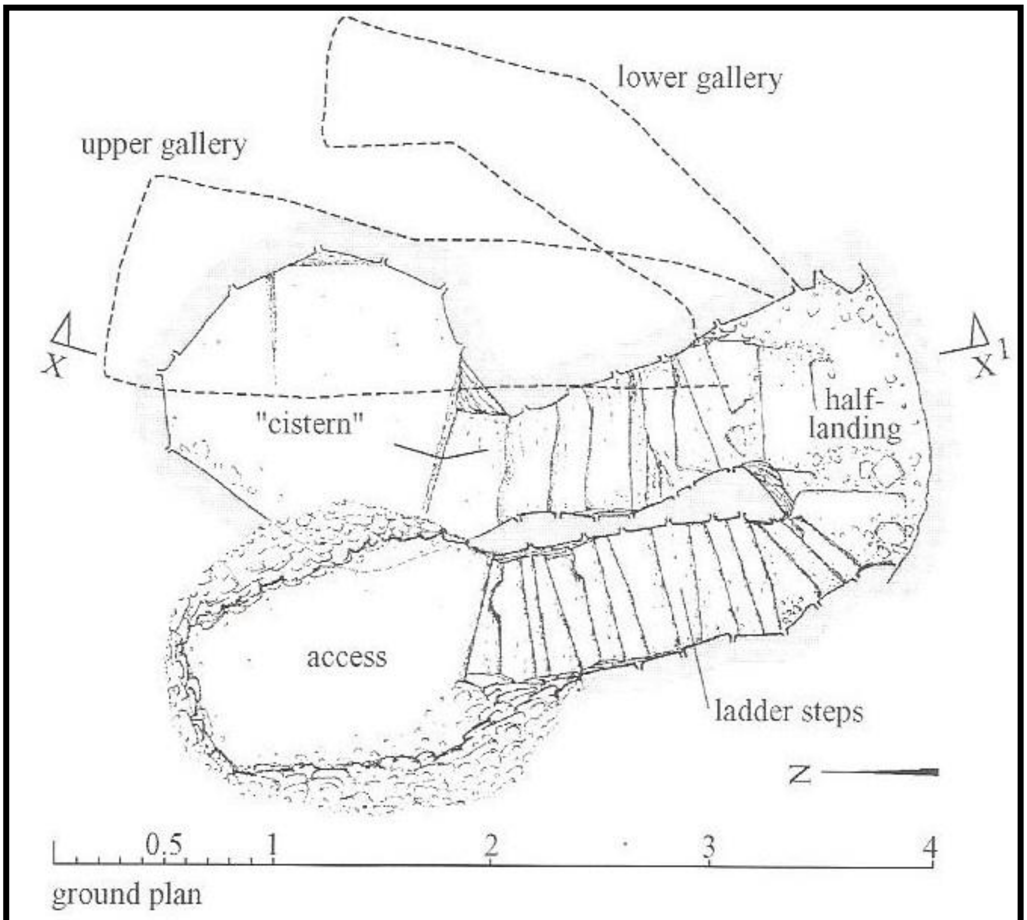


Conwy Castle (13th Century).
Author's Photo.

unable to freely wield their sword (assuming that it was held in their right hand) without being hampered by the wall on their right. However, it should be noted that the function of the spiralled, narrow and often steep staircases of castle towers is to hamper any right-handed sword action, with the staircase's centre aiding this. Brochs do not possess that centre however, and the incline of broch staircases also tends to be quite gradual, lacking the tight spiral of the Medieval castle tower (Figure 4.17). I would thus argue that this represents a symbolic architectural tradition across Scotland, perhaps as part of a ritual or as a general rule of construction to be followed, with movement upwards being conducted clockwise, and movement downwards being conducted counter-clockwise.

Interestingly, as to be explored in much greater detail in Chapter Seven, this rule may not have only applied to broch towers and the domestic space. The non-domestic, subterranean – and seemingly ritualistic – two-storey 'well' structure of Mine Howe (as noted briefly in Chapter Two) in Orkney also follows this rule (Figure 4.18). The enigmatic underground chamber of Mine Howe is accessed by a steep, ladder-like, staircase of narrow stone steps which descend towards a cistern area at the bottom of the underground chamber. Interestingly, the twisting stairs of this site descend anti-clockwise, meaning that

Figure 4.18. Mine Howe Plan (Crown Copyright: RCAHMS).



as one begins to ascend from the base of the structure, one has to move clockwise around the structure, just as one would ascend towards the upper levels from the ground floor of a broch. Mine Howe thus emphasises this right-ways ascension rule which certainly seems to have applied to the brochs.

The object of attention at Mine Howe, however, seems to have been the well at its base, and yet this would have been approached on the left. Although this may have been appropriate for this site, we cannot be certain as we are unable to ascertain the ways in which Iron Age Orcadians comprehended the Mine Howe complex. However, the fact that one ascends to the surface in a clockwise direction suggests that the direction of movement upwards was meant to be conducted clockwise, and any descent was intended to be anti-clockwise, and that this was an important rule for Iron Age communities across Scotland. Indeed, when the hole for Mine Howe was originally dug, this rule of movement certainly seems to have applied when the structure's twisting staircase was constructed.

With this in mind, the purpose of the round tower of the broch may become clear, as it is only within the tower that one possesses the ability to ascend in a complete sunwise circuit, and that this was always ascending. At Mine Howe too, the stairs turn entirely around on themselves, thus completing a circle of movement from its entrance in the north back to the north again towards the base of the structure. Interestingly, Mine Howe, as a subterranean 'well' – and thus as a physical 'inversion' of the broch tower (an idea explored in Chapter Seven) – parallels the Early Medieval Irish literature which associates the north with that which is inversed and left (Karl 2008: 71); with Mine Howe not only possessing a northern entrance, but also a left-ways staircase. This is likewise mimicked in the 'well-like' underground structures found within many Orcadian brochs; features which are often located in the northern quadrant of the broch's courtyard. A link to the north, to the left, and to underground structures, may have thus been significant then; a theme to be explored in later chapters.

What this all alludes to, however, is that there were rules as to what made suitable approaches in Iron Age Scotland. As suggested, 'right-ways' movement (which was conducted in a circular fashion in brochs and at Mine Howe) may have related to the right-ways movement of the sun across the sky from east through to the south and into the west. Interestingly, this was a theme which was also present in Medieval and even modern Scottish society in which fishermen would turn their boats with the sun, and even when launching a boat, the stern would go into the water first and then be turned starboard. This was a rule also to be followed on the shore too, as food would be stirred in a clockwise direction so as to deter bad luck which was thought to occur if it were stirred anti-clockwise. Indeed, in Gaelic custom, clockwise movement is known as ‘deosil’, from the Gaelic (Irish *deiseal,* Scottish *deiseil;*) which also means ‘to the right’ or ‘to the south’. An anti-clockwise movement on the other hand is thought to be ‘against the sun’ (i.e. against that which is natural) and is known as ‘widdershins’ (from the Middle High German ‘widersinnes’ – ‘in a contrary direction’) or ‘tuathal’ (Irish *tuathal*, Scottish *tuaitheal)* which means ‘to the left, to the north, in a wrong direction’ (Farrar and Farrer 2012; McManus 2002).

It is likely that the broch’s aversion of the ‘left’ held similar symbolic associations, which may have likewise been associated with the movements of the sun. Indeed, as already noted, the broch tower, with its internal staircase, may have allowed a complete sunwise circuit around the structure; a circuit that was always ascending – like the sun when it is in the east. At first glance then, this would seem to strongly support the theory that people moved around the broch in a sunwise direction; and this is something which certainly remains true across the different regions of Scotland.

However, if a strict adherence to the cosmological model was to be taken, we would expect that the intramural staircases, and their sunwise ascension, would predominantly be found in brochs orientated toward the east or south-east. They obviously do not however, with 32.89% of sunwise intramural staircases to be found in western orientated sites, such as we see at the western facing site of Mousa in Shetland, for example. When we also consider that all but one (i.e. Dun Grugaig, Skye) of the intramural staircases found in brochs ascend sunwise, the fact that nearly a third of the set faces west must be considered as more than a mere discrepancy from the norm. Furthermore, if, as Parker Pearson and Sharples (1999a: 17) and Armit (2006: 251) have argued, that western facing sites represented oppositionally organised roundhouses (with movement being conducted counter-sunwise around the interior), then why do western orientated brochs possess intramural stairs that ascend sunwise? Surely, if the argument were to stand, the staircases within these structures would ascend counter-sunwise, as the home would act as a mirror image of eastern facing sites.

For western facing brochs, it may be that the entrance orientation did not matter then, as the upper floors acted as the main living area instead of the ground floor, thus allowing the door to be orientated differently from the eastern norm. Indeed, the commonality of a scarcement ledge in most well-preserved brochs has led to the theory that the main living area was actually located above ground level on a raised timber floor (Sharples 1998: 38-40), although some scholars disagree (e.g. MacKie 2010). As expressed in the previous chapter, the original structure of the broch may have consisted of a ground floor for animals (in stalls) and an upper floor, resting on the still visible scarcement ledge, though this may have differed between different types of site. Within these upper floors, clockwise movement around the hearth may have taken place (Reid 1989; Hingley 1990b). The hearth – as assumingly the symbolic heart of the 'home' – was probably very significant in this regard, and as noted in the previous chapter, multiple hearths could have existed on multiple levels. As western facing brochs may have also tended to be taller, they may have thus been better suited to holding upper floors which could then have been used as the main living areas.

This is speculation however, as it is impossible to ascertain whether this is true since these upper floors no longer exist. It is safer to suggest that such engineered right-ways movement was part of a social ritual, with any approach from the left side perhaps being seen as a threatening gesture or an expression of ill intent similar to the protocols expressed in the Early Medieval Irish literature, and that this was conducted regardless of doorway orientation. Indeed, the fact that western facing brochs – which according to the cosmological model act as reversed opposites of eastern facing sites – universally possess clockwise ascending staircases suggests that this was a custom which, even if it was not cosmologically inspired, was inviolable (apart from at Dun Grugaig in Skye, with its anti-sunwise staircase), and so it is likely to have been inspired by a social custom that stretched across Scotland. This may have related to hospitality, acceptance, or class and gender issues. Indeed, it may have simply acted as a tradition of good will, and this may or may not have related (originally at least) to the movement of the sun; a custom which was significant within Medieval Gaelic custom.

As it was the upper floors of brochs which were approached on the right, these upper stories may have acted as areas of hospitality and respect, and were meant to be approached as such. Indeed, as there is obviously an inclination throughout humanity, formally or informally, to divide spaces and create boundaries to define personal space, spaces for close kin, and spaces where friends, neighbours, and strangers can meet within the home (Allan 1989: 145), one can assume that the broch too would have been divided according to similar themes. With this in mind, the upper floor/s of the broch are likely to have been significant, or even private areas, and one may assume this because, as originally implied by Foster (1989a), in order to arrive at these spaces, movement through numerous cultural and physical 'boundaries' had to be conducted. These included: (a) the broch's estates/lands (or waterbodies, as in the case of island brochs); (b) its outworks and enclosures; (c) its blockhouse (if it had one, as at Clickimin and Burraland in Shetland); (d) its entrance; (e) its ground floor, and (f) its intra-mural staircase.

Boundaries (physical, sociocultural, and psychological) are constructed and maintained by ritualised practices, and act as basic forms of social structure (Pellow 1996). The necessary progression through multiple boundaries (of different types) means that it is likely that these upper floors were significant areas; spaces set aside for significant gatherings or particular rituals which would not easily be encroached upon by outsiders who could potentially violate the space with their presence (Belk 1988: 151-152). As such, a suitable and socially sacrosanct approach may have been required – i.e. on the right-hand side.

The evidence for this is obviously lost as no upper story survives. But what it does suggest is that doorway orientation may have been insignificant with regards to right-ways, or even sunwise, movement around the structure and up the staircases, thereby undermining the argument of the cosmological model in this regard. This suggests that either the symbolism relating to doorway orientation was different to that of the cosmological model in someway (perhaps being regionally defined) or orientation was primarily practical, avoiding the wind and seeking the light, as alluded to in the previous chapter which compared broch orientations with that of the blackhouses. This highlights a significant point: that although the brochs possess universal features (guard-cells, prominent entrances, wall voids, clock-wise ascending staircases), the primary difference that exists between them is that of doorway orientation.

Conclusion: The Symbolic Home?

The assumption of the home as a purely practical structure represents a rather ethnocentric notion, influenced perhaps by capitalistic ideals which privilege the idea of private home-ownership and the idea of home as ‘dwelling’ only. But the home is not *just* a dwelling.

The ‘home’ often acts as the social heart of human culture, within which the creation of symbols and meanings can become important forms of legitimation, and become crucial to the exercise of authority (Dovey 1999: 12). On this note, and as explored earlier, it is unlikely that authority was solely expressed through defensibility with regards to the brochs. The emulation of cosmologically significant markers however, such as the sun – as expressed in: (a) the brochs’ rounded structure, (b) doorway orientations towards significant cardinal directions, and (c) through sunwise movement around the interior – could have been but one way that authority was able to be established within the broch home; with the structure (and by association, its inhabitants) acting as analogies of the sun – a powerful, agriculturally significant and seemingly eternal source of life. This is conceivable, even probable, because the quest for authenticity that such ‘simulation’ (also see: Baudrillard 1994) can represent, is a quest for authority, enmeshed in issues of power (Downey 1946; Vale 1992).

It is not difficult to imagine that within an agricultural society like Iron Age Atlantic Scotland, authority may have been established by associating the home with the sun. The movement of the sun may have even inspired various traditions and customs relating to the directions ‘right’ (sunwise) and ‘left’ (anti-sunwise) within the home, as they did in Medieval Scottish society; perhaps acting as part of rituals relating to hospitality and acceptance, a theme which seems likely. The east and west may have also been granted significance as demonstrated in certain floor deposits (such as at Dun Vulan), in the tendency for the home to face east or west in Iron Age Scotland, and also in potentially taller western facing broch towers.

However, with regards to doorway orientation, gaps in our understanding remain, and one needs to ask whether the broch’s general focus towards the sun merely represented the need to orientate the doorway towards the available light; a feature which surely differed across Scotland, depending on topography. This may explain why western facing brochs possessed sunwise staircases – because doorway orientation did not relate to either sun-based cosmology or hospitality rituals, even if broch staircases may have linked to both of these themes. Was doorway orientation simply an issue relating to light and wind then?

To contemplate this question, I wish to ask how the position of the home in the landscape impacted the amount of light entering the structure and were doorways orientated in such a way that light entering the home was indeed maximised. This is a question which is to be examined in the subsequent chapter. It is, however, a very large issue, and a narrower focus is required.

As noted, in the northern latitudes of Shetland and Orkney, there exists a marked contrast between the eighteen hours of sunshine at midsummer and eighteen hours of darkness at mid-winter, and an examination of individual sites and the light and shadow which falls upon them throughout the day and year will provide an interesting and clarifying study on the importance of orientation in these areas.

Chapter Five

Shadows in the Landscape: Lightscapes in Shetland and Orkney and their Impact on Broch Orientation and Location

Introduction: The Importance of Light in Life

This chapter represents two in-depth studies on Shetland and Orkney which attempt to explore how lightscapes (the distribution of light and shadow in the landscape) influenced broch doorway orientation and site location[11]. Despite significant discussion on doorway orientation in Iron Age scholarship, archaeologists have rarely considered factors such as the distribution of light and shadow, and the ways in which they greatly influence what can and cannot be seen. And yet, good visibility remains one of the most important determinants of how space is used within both landscapes and structures, which include the home (Dawson et al. 2007; Gillings and Wheatley 2002: 201), and this is the issue to be dealt with here.

The neglect of such a significant facet of daily human life may reflect our modern ignorance of how light affects each of us. As noted in Chapter One, human life – its rhythms and dynamics – have been dramatically altered by electric light; allowing us to not only dispel the night and its accompanying darkness at will, but to also forget how dependent life was on good light in the past. With this in mind, one can begin to consider that for the Iron Age broch inhabitants of Orkney and Shetland (and indeed, for much of Scotland), light would not have been a thing to be taken for granted, as we seem to take it now. In the northern latitudes of Shetland and Orkney, where there remains a stark contrast between the available sunshine at midsummer and that of midwinter, light would have been an invaluable commodity during the darker half of the year.

Of course, Scottish Iron Age communities did possess the ability to generate their own artificial light. The hearth (or hearths) – most likely fuelled by peat, as

[11] The total sample of orientations for this chapter was retrieved from various sources; especially from Canmore within the Royal Commission on Ancient and Historical Monuments of Scotland database inventories. A variety of other publications (e.g. Hedges 1987a; 1987b; 1987c; Mackie 2002a; RCAHMS 1946. were used to gather information and accurate site plans; with many orientations also being verified by my own observations in the field. All base maps are © Crown Copyright Ordinance Survey: An Edina Digimap/JISC Supplied Service.

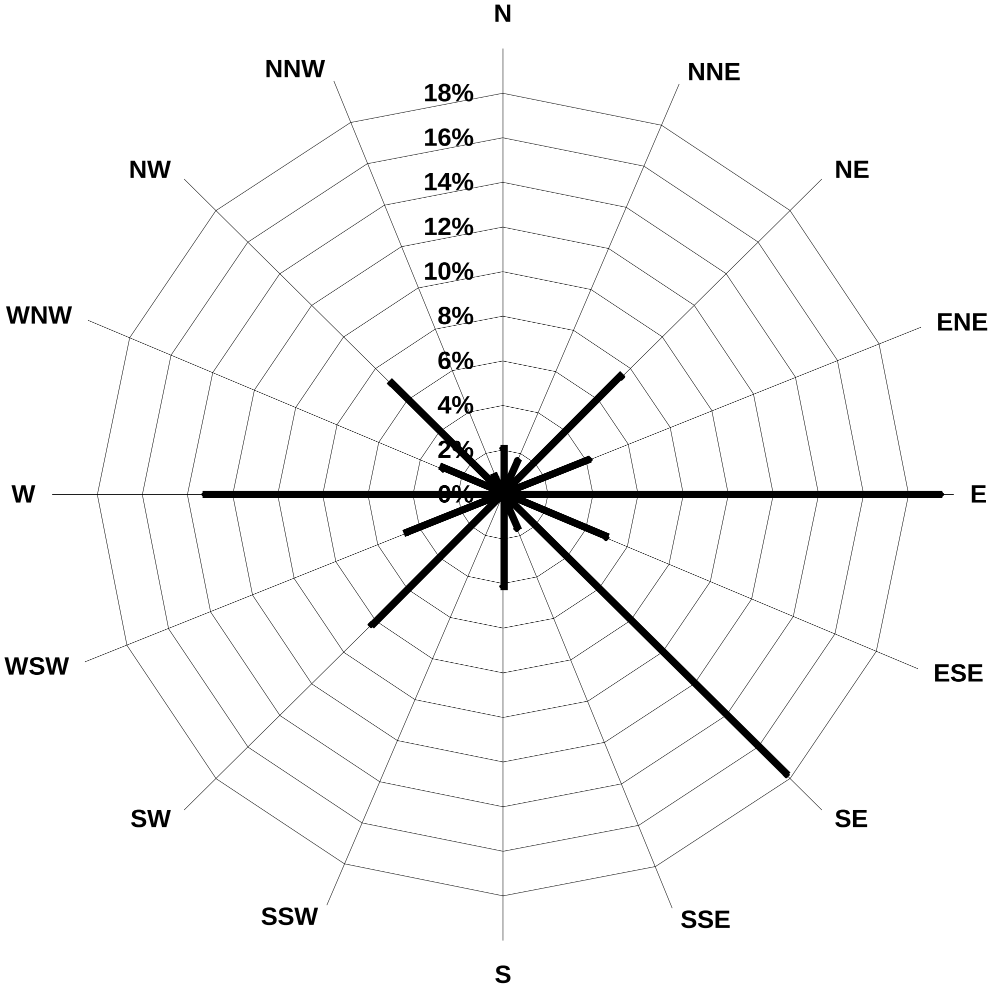
suggested in Chapter Three – was probably the brightest source of light within the broch; though this would have often been supplemented by a variety of stone lamps around the interior – a common find in broch excavations (e.g. Crosskirk, Caithness; Midhowe, Orkney; Gurness, Orkney; Castle Craig Broch, Perthshire). These lamps would have presumably been fuelled by oil, grease, fat or blubber, and would have probably utilised wicks made of rushes or moss dipped in fat or oil (Miller 2002: 41).

However, the exact nature of light within the broch remains unclear. This is because, as no broch roof survives, archaeologists are unable to ascertain whether the roof had a smoke hole; a feature which would have obviously admitted extra light, and would have thus changed the dynamics of the interior. One can imagine, however, that at night (and also throughout the dark winter months), the hearth – complemented by a collection of lit stone lamps – would have created levels of light which would have still been much dimmer than modern western architectural standards, which use bright, monotone electric light sources. Indeed, the broch inhabitants, dwelling in these consistent levels of low lighting, would have probably been required to make greater use of senses other than sight (e.g. haptic) when performing everyday tasks (e.g. cooking, carving, sewing) which, from our own western perspective, would require much higher levels of lighting (see: Dawson et al. 2007). One can assume then that any method of gaining extra light within the broch would have been sought; with the orientation of the broch doorway therefore being of crucial concern to any builder.

With regards to the ways in which light may have influenced doorway orientation and the daily function of the roundhouse, Pope (2007) notes that sunlight – both direct and ambient – are best sourced from the southern sky (cf. Oswald 1997: 92), and so a southern orientation, one could assume, would be preferable, as noted in previous chapters. By then taking into account shelter from the wind however, she argues that there exists a light/shelter optimum for any doorway between the east and the south-east.

Pope (2007: 212) also notes that this light/shelter optimum was popular for doorways in the Iron Age, arguing that there was a shift in roundhouse orientation from a southerly direction – which maximises light – in the Bronze Age (Drewett 1982), towards the light/shelter optimum (the south-east) in the Iron Age; something which reflects climatic changes the beginning of the Iron

Figure 5.1. Entrance Orientation Pattern for 242 Brochs across all of Scotland.



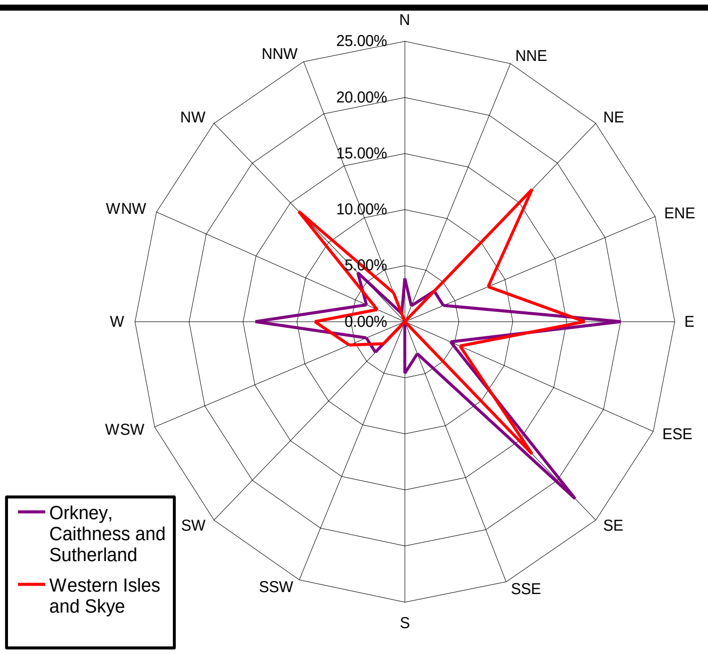
Cardinal Point	No. of Brochs
N	5
NNE	4
NE	18
ENE	10
E	47
ESE	12
SE	43
SSE	4
S	10
SSW	0
SW	20
WSW	11
W	32
WNW	7
NW	17
NNW	2

Age, as explored in Chapter Three. It could thus be assumed that any broch builder wishing to gain the most light through the broch's often small, narrow doorway, would have selected the SE as the orientation to their house; a decision that reflects the growing need for shelter during this period of climatic decline. There is, of course, variation to this rule across much of Scotland, as seen in Figure 5.1.

However, variation in doorway orientation, as Pope (2007: 214) suggests, might be explained according to differences in latitude; that is, the further north one goes, the fewer daylight hours one has available throughout the winter, and so orientation will be assumed to have a more southerly focus the further north one lives. In Highland Scotland for example, Pope (2003) notes a predominance of SE orientated roundhouses in the Iron Age before going on to demonstrate that in Southern Scotland and Northern England, there was a focus towards the ESE; while eastward orientations in general would seem to be prevalent in Central Britain. It would thus appear that the more northerly an Iron Age site is, the more southerly the orientation becomes, as would be expected in a purely functional explanation focusing on both light provision and shelter. Pope (2007) can thus suggest that in Northern Britain, the southerly orientation that many sites supposedly possess only reveals the builder's concern with maximising available daylight.

However, a southerly or eastern orientation is by no means the universal case

Figure 5.2. Comparison between Broch Orientation patterns of Orkney, Caithness and Sutherland (130 brochs) with that of the Western Isles and Skye (36 brochs).



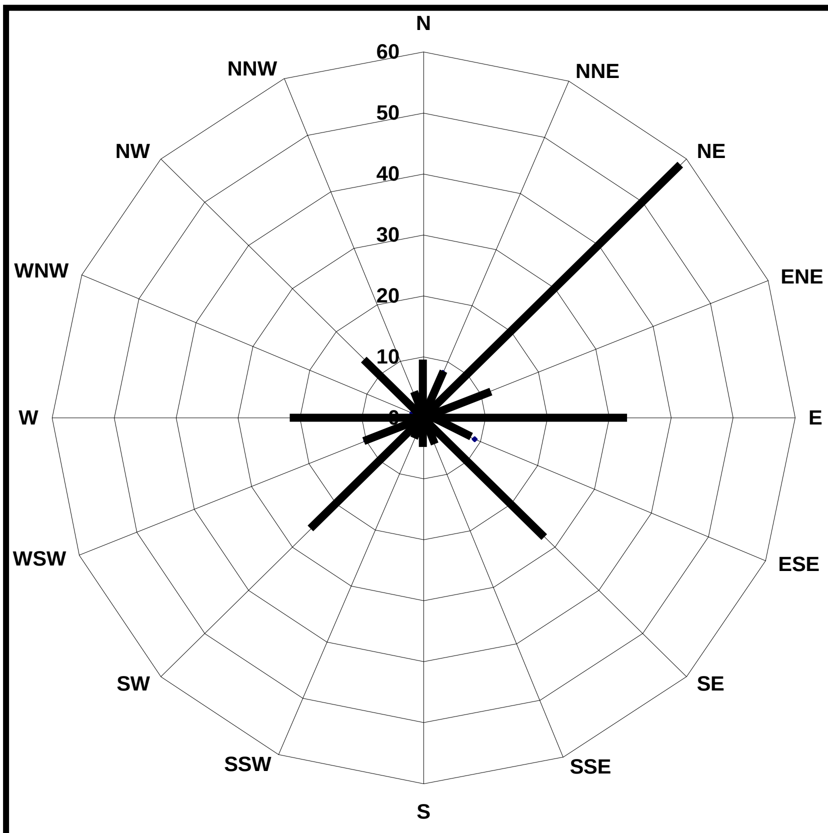
Cardinal Point	Orkney, Caithness, Sutherland	Western Isles and Skye
	No. of Sites	No. of Sites
N	5	0
NNE	2	0
NE	5	6
ENE	5	3
E	26	6
ESE	6	2
SE	29	6
SSE	4	0
S	6	0
SSW	0	0
SW	5	1
WSW	5	2
W	18	3
WNW	5	1
NW	8	5
NNW	1	1

throughout the differing regions of Iron Age Scotland, and out of the brochs in Scotland which have discernable entrances towards specific cardinal points, a high proportion are actually to be found orientated outside of the E/SE arc (Crowther 2011), as demonstrated in Figure 5.1.

Indeed, there is a wide variation between broch orientations in the Western Isles and Skye, and those brochs located in Caithness, Sutherland and Orkney (Figure 5.2), which are in fact very dissimilar from one another (see Crowther 2011: 53-54). Though the northern brochs (130 sites) of Caithness, Sutherland and Orkney did indeed favour the more southerly ESE-S-WSW arc – with 42.31% (55 brochs) of local broch entrances being orientated within it (something which may be in part due to the northerly latitude of Northern Scotland) – for the Western Isles and Skye, broch builders actually tended to favour a northerly orientation, with only 30.56% (11 brochs) of available sites being orientated within the southerly ESE-S-WSW arc in comparison to the 44.44% (16 brochs) found within the more northerly ENE-N-WNW arc.

If we also consider the duns of Argyll (Figure 5.3), we find that many were orientated towards the NE (also see: Crowther 2011: 51); an orientation that is

Figure 5.3. Dun Orientation Patterns for Argyll and Bute (240 duns).



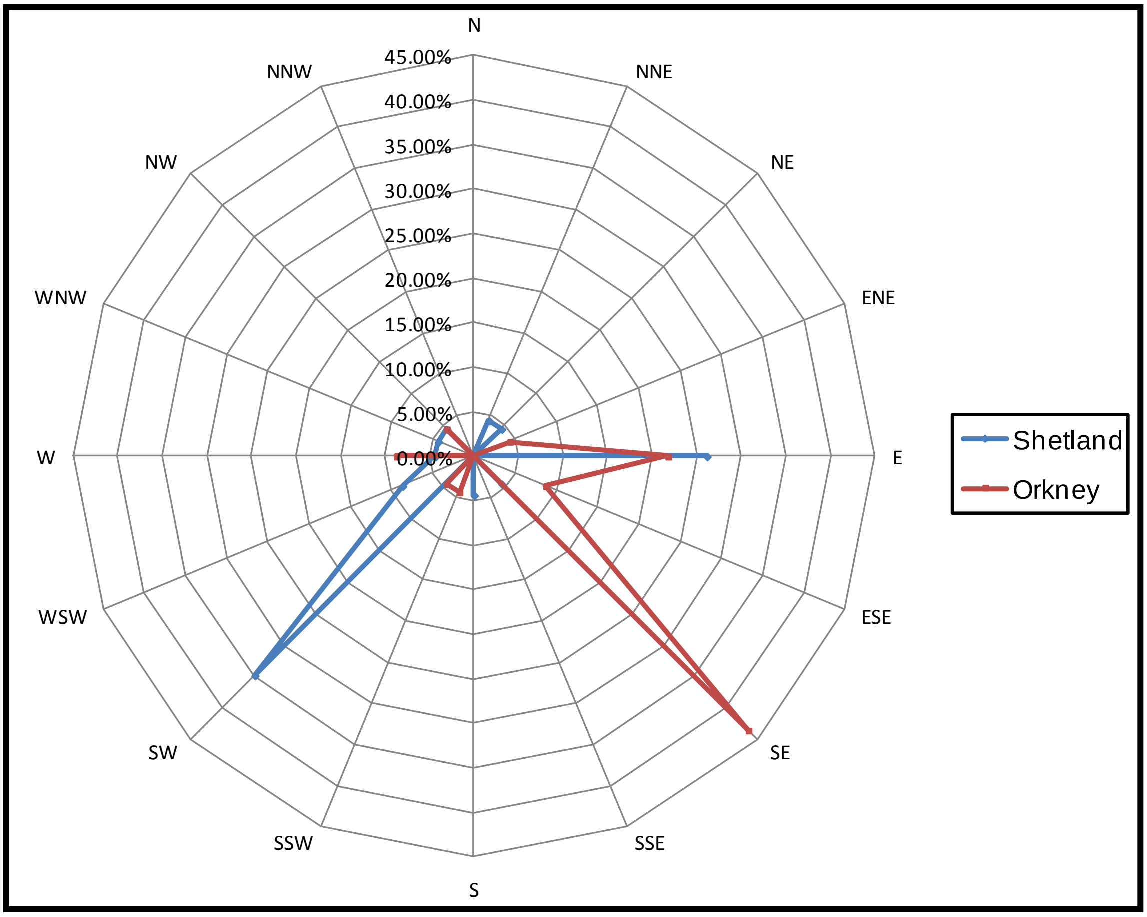
Cardinal Point	No. of Sites
N	9
NNE	8
NE	58
ENE	11
E	32
ESE	9
SE	27
SSE	4
S	4
SSW	3
SW	25
WSW	10
W	21
WNW	2
NW	13
NNW	4

very much summer inspired (at least in terms of light provision). By taking a simple functional approach to light and orientation then, it would seem that a large percentage of brochs within the Western Isles, and many of the duns of Argyll, were oriented to capture the summer sun alone, despite the differences in latitude that exists between the west and the north.

Interestingly, out of the numerous regions of Scotland, only the Orkney Islands present what could be described as a standard E/SE pattern of orientation which reflects the practical need to orientate within Pope's (2007) shelter/light optimum (Figure 5.4). With regards to any universal desire for year-round light during the Iron Age then, there seems to be disparities between regions. So why might this be the case?

The difference may relate to seasonal usage and the differences we see in the orientations of the brochs of the Western Isles and those of Northern Scotland may imply that certain sites in the west were seasonally occupied during the summer months alone; though obviously, this is one explanation of many. Issues of cosmology or a simple wish to distinguish one locality from the other also present possible answers to the question of variety. What is obvious,

Figure 5.4. Comparison between Broch Orientation patterns of Orkney (23 brochs), and Shetland (23 brochs).



however, is that the nature of light and its impact on site orientation and site positioning is perhaps more complex than previously assumed, with many factors influencing any single orientation. With this in mind, I wish to explore the nature of light within two northern regions whose broch orientation patterns strongly differ from one another – the Shetlands and the Orkneys (Figure 5.4).

Both sets have a strong tendency to orientate within the E-S-W arc, with 82.61% (19) of Shetland's brochs, and 91.30% (21) of Orkney's brochs orientated within it. But when considering Pope's (2007) light/shelter optimum, both sets differ remarkably. Whereas 73.91% (17) of Orkney's set faces into the E/SE, only 30.43% (7) of Shetland's brochs face the same way. Instead, Shetland has a large proportion facing into the W/SW arc (47.84%; 11 brochs), in comparison to Orkney's 13.04% (3 brochs). The reasons for this are unclear, though it may relate to light availability, the direction of prevailing winds, and topographical issues. Each of these will briefly need to be defined, beginning with a study on the environmental factors of Shetland, and how this may have influenced broch orientation; before moving on to compare it with that of the Orkneys.

The Environment of Shetland and the Orientation of its Brochs

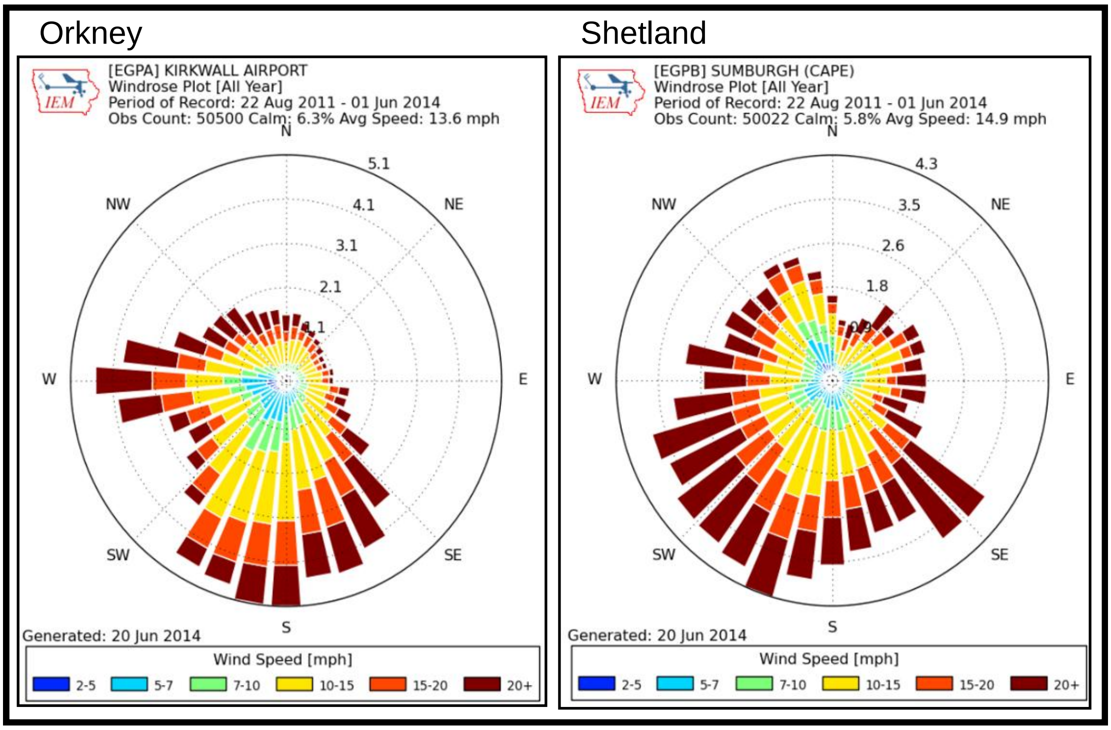
When considering what may be the most beneficial orientation for brochs in Shetland, the wind rose in Figure 5.5 – which illustrates the frequency and strength of winds blowing from particular directions over a three year period – would suggest that the most sheltered direction is due east, with any doorway between the ENE and E being fairly well sheltered from the wind.

When it comes to light availability however, Shetland's extreme northern latitude means any orientation within the SE-S-SW arc – and especially between the SSE, S, SSW – would be beneficial for any site throughout the winter months especially. For both light and shelter then, an orientation towards either the SE or SSE would seem to have been the best for any broch in Shetland. And yet, the broch orientation pattern for Shetland does not conform to this pattern.

As we can see from Figure 5.6, out of the 23 brochs examined here, 12 sites (52.17%) are indeed to be found within the southern arc (between ESE-S-WSW). However, although due-east is somewhat popular – with 6 sites (26.09%) – Shetland's orientations are strange as only 1 site (4.35%) is orientated towards the SE, whereas 8 (34.78%) face the SW. Indeed, the SW arc, between the WSW-SW-SSW, account for a total of 10 sites (43.48%), in comparison to the 1 site (4.35%) found within the ESE-SE-SSE arc (the site which faces the SE), even though that that particular arc should be considered the best for any doorway in Shetland, at least with regards to light.

It is odd that the SW was such a common orientation in Shetland, with these brochs facing the prevailing winds – a climatic feature infamous for its ferocity in these islands. As there are no indications of significant long-term changes in wind direction, wind speed and precipitation in the Northern Isles (Bennett, Boreham, Sharp and Switsure 1992; Kutzbach and Guetter 1986), we could

Figure 5.5. Wind Roses for Orkney and Shetland, collected 22 Aug 11 – 01 Jun 14.

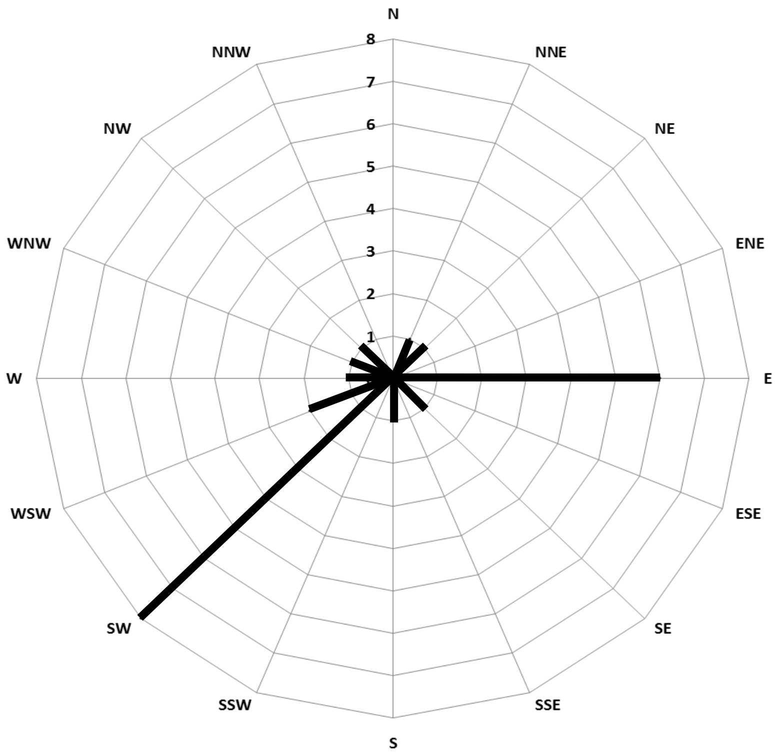


also assume that the environmental factors of wind and rain influenced the orientation of Iron Age sites as it would influence orientation now. And so it is important to briefly explore Shetland's climate further for possible explanations.

Shetland comprises a group of sparsely inhabited islands, lying in the north-east Atlantic Ocean about 78km north-east of Orkney and about 350km west of Norway. Much of the coastal areas of Shetland can be described as 'hyper-oceanic', resembling much of lowland Orkney and Caithness, but possessing a cooler climate than the Western Isles (Birse 1971; 1974). According to Irvine (1968), Shetland, like Orkney, possesses a climate that is generally mild in winter and cool in summer, with mean monthly rainfalls ranging between 53mm in June to 117mm in November and an overall annual rainfall of 1029mm.

Prevailing winds are south-westerly in Shetland, though throughout much of the year it is also common for winds to enter from the north, the south and the south-east also. These are generally strong however (Irvine 1968); and indeed, the Western and Northern areas of Northern Scotland (with special reference to the Western Isles, Orkney and Shetland) are, on average, the windiest places in the UK, being fully exposed to the Atlantic and closest to the passage of areas of low pressure. Though spring time tends to have a maximum frequency of

Figure 5.6. Doorway Orientation of 23 Shetland sites to be analysed in this chapter.



Cardinal Point	No. of Sites
N	0
NNE	1
NE	1
ENE	0
E	6
ESE	0
SE	1
SSE	0
S	1
SSW	0
SW	8
WSW	2
W	1
WNW	1
NW	1
NNW	0

winds from the north east in Shetland – due to the common build of high pressure over Scandinavia during this time of year – the frequency and depth of low pressure depressions is greatest during winter, especially between December and February. It is then that mean speeds and gusts (short duration peak values) are at their strongest; with the SW and WSW orientated brochs on Shetland being particularly vulnerable during these times.

Overall, Shetland's average wind speeds are 5-7 meters per second, and gales are recorded for 58 days of the year (Irvine 1968). This means that Shetland has many more annual gales than Orkney, thus marking it as one of the windiest places in the British Isles (Berry and Johnston 1980). Indeed, though the valleys are offered shelter from the wind, on some of the higher peaks, the wind and climate can be much colder and much more severe, and the climate there can be considered ‘subarctic-oceanic’ (Spence 1957: 920).

Yet, though these statistics only seem to make Shetland’s SW facing brochs even more perplexing, one should remember that the terrain of Shetland is much hillier than that of Mainland Orkney (with its brochs facing the E/SE light/shelter optimum). The fact that Orkney’s brochs tend to face the orientation optimum of E/SE may reflect the nature of its flat landscape then, thereby permitting its brochs to orientate appropriately. In this way, it could still be that the broch builders on Shetland were taking advantage of the available light, but were forced to orientate towards generally unpopular cardinal directions, such as the SW, due to the location of the site, perhaps positioned in a valley for example.

The Environment of Orkney and the Orientation of its Brochs

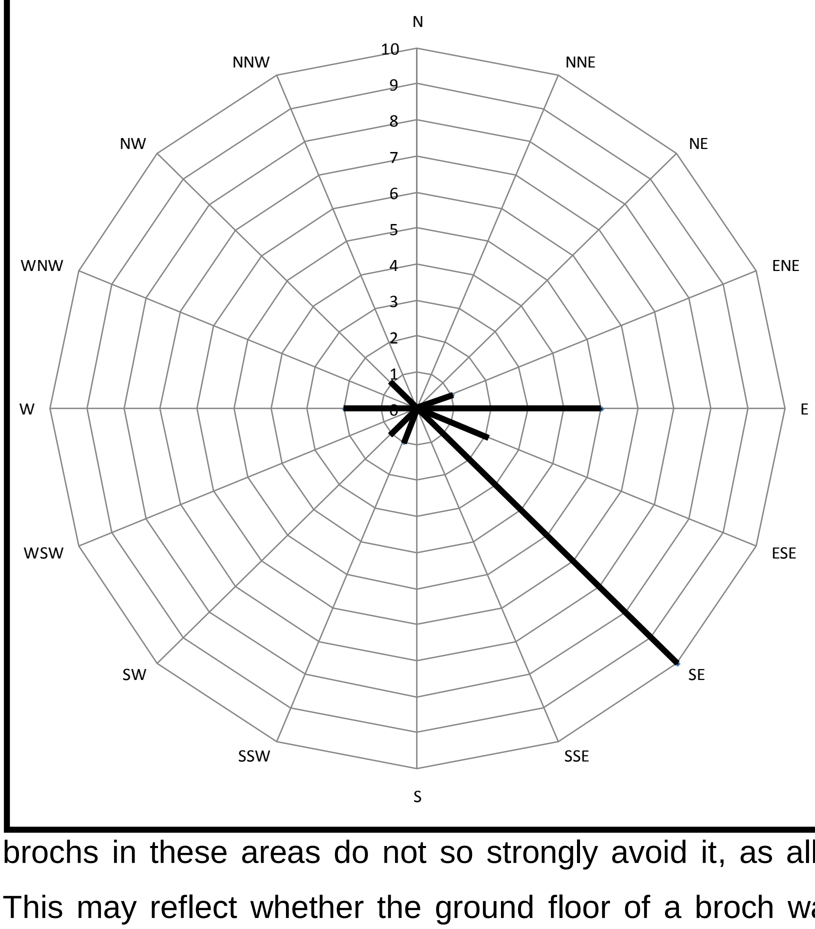
The Orkney Islands are located upon a latitude of 59.68N, possessing a climate that is defined as ‘hyper-oceanic’ – the most oceanic category in Scotland; something which is otherwise applied to the Western and Northern Isles and peninsulas of the extreme west and north coasts of Scotland. Orkney thus lies in the direct path of Atlantic depressions and, like Shetland, this influences one of the most characteristic features of the Orcadian climate – the frequency of strong winds. High winds travelling more than 8m per second (17.9 miles per hour) occur for over 30% of the year and gales occur on average for 29 days per year (Davidson and Jones 1985) Certain areas are more sheltered than others of course, however the outer coast of Mainland Orkney, the southern cliffs of South Ronaldsay, and Hoy are extremely open, and strong winds are consequently exceptionally severe in these locales.

Indeed, with hurricane force winds of 140mph having been recorded across Orkney (Marsh 2001: 20), the islands are noted for winds that are so strong, trees are unable to grow without appropriate shelter (Davidson and Jones 1985: 20). However, as Orkney lies directly in the path of the warm waters of the North Atlantic Drift, other climatic aspects of the island’s latitude are diminished, and Orkney is provided with a fairly reasonable climate, with winter temperatures somewhat higher than would be expected for this latitude (Davidson, Jones and Renfrew 1976), with a varying monthly mean of 3.6°C in

January to 12.3°C in August. Indeed, in winter the temperature rarely falls below freezing (Bullen 2000: 320-322), however the frequent winds (refer to Figure 5.5) which not only come in from the WSW but also enter from the entire arc between the W and the SE for at least 60% of the year (De Kluijver 1993: 732; Jones 1975), is often coupled with driving rain, thus producing a substantial wind-chill factor.

Considering its harsh climate then, and as noted earlier, it is interesting that only the Orkney Islands present what could be described as a standard E/SE pattern of orientation which reflects the practical need to orientate within Pope's (2007) shelter/light optimum (Figure 5.7). However, even though Orcadian brochs do tend to avoid the prevailing winds, it is known that the prevailing SW winds of the Western Isles are often stronger, and yet, the orientations of

Figure 5.7. Doorway Orientation of 23 Orkney Brochs to be analysed in this Chapter.



Cardinal Point	No. of Sites
N	0
NNE	0
NE	0
ENE	1
E	5
ESE	2
SE	10
SSE	0
S	0
SSW	1
SW	1
WSW	0
W	2
WNW	0
NW	1
NNW	0

brochs in these areas do not so strongly avoid it, as alluded to in Figure 5.2. This may reflect whether the ground floor of a broch was utilised or not – an issue which may have differed across Scotland. Indeed, as noted in Chapter Three, the existence of a scarcement ledge in most well-preserved brochs has led to the idea that the main living area was located above ground level on a raised timber floor (Sharples 1998: 38-40), although some scholars disagree (e.g. MacKie 2010), perhaps correctly.

The use of the upper-storeys as the main living areas may have been the case for many brochs however, though it is likely that in order to maintain a dry environment within these upper stories, multiple hearths would have been required throughout the tower. The E/SE orientation conformity towards the light/shelter optimum on Orkney does suggest that the ground floor was utilised as a living space however (as far as a simple functional desire would suggest anyway); as does the existence of stone furniture and hearths within those brochs which have survived (e.g. Howe, Gurness, Midhowe); though it should be noted that these may have been later additions. The differences of orientation in the Western Isles may highlight that those who inhabited these dwelt within upper storeys without the requirement of direct sunlight to illuminate the lower storeys and who could therefore orientate their dwellings in a more random manner.

However, as noted earlier with regards to Shetland, differences between regions may depend on local topography, and so this must be taken into account when we begin to examine site orientation and the duel influence of light and shelter upon it. To do that, it is necessary to plot the fluctuating lightscapes around Shetland and Orkney's brochs to better understand how light changes and moves around these sites throughout the day and year.

Recording Lightscapes in the Landscape: A Methodology

Geographical Information System (GIS) technology integrates hardware, software and spatial data to capture, store, update, manage, analyse and display geographical data and phenomena (Burrough and McDonnell 1998; Chalkias and Faka 2010). GIS is thus an effective technology for analysing complex spatial phenomena, and has been successfully used in a wide variety of applications[12]. Spatiotemporal analysis of such phenomena is one of the

[12] Examples include: earth science, urban utilities planning, transportation, natural resources protection and management, forestry, natural disasters, and various aspects of environmental modelling and engineering (see: Bahaire and Elliott-White 1999; Chalkias, Psiloglou and Mitrou 2006; Chalkias, Petrakis, Psiloglou and Lianou 2006; Lake, Mithen and Woodman 1998; Rancic, Predic and Dimitrijevic 2006; Tikniouine, Elfazziki and Agouti 2006; Vargues and Loures 2008)

primary tasks of GIS and for this section of the thesis – which investigates the relationship that exists between landscapes and the light which falls upon them – GIS is used to model the exposure of direct sunlight on the landscapes of Shetland and Orkney.

In order to achieve this somewhat elusive task, I required the maps on which I could plot my selected Iron Age brochs. When mapping lightscapes, it is very important to gather the most accurate and detailed maps possible, and so I used Light Detection and Ranging (LiDAR) data; an airborne mapping technique which uses a laser to measure the distance between the aircraft and the ground. With up to 100,000 measurements per second made of the ground, it allows highly detailed terrain models to be generated at spatial resolutions between 25cm and 2 metres, and provides a very detailed Digital Terrain Model (DTM) in the process.

Since its introduction, LiDAR has become increasingly well established in archaeological research (see: Holden, Horne and Bewley 2002; Wehr and Lohr 1999), with applications ranging from landscape geo-archaeological analysis (Carey et al., 2006; Howard et al., 2008; Lennon and Crow 2009; Page, Barker, Driver and Murphy 2008), or the use of LiDAR to assist in the compilation of systematic records of the historic environment (Bewley, Crutchley and Shell 2005; Challis et al., 2008), to applications utilising some of the unique facets of LiDAR; for example, its ability to penetrate the vegetation canopy and to record underling archaeological features (Devereux, Amable, Crow and Cliff 2005; Doneus and Briese 2006; Doneus, Briese, Fera and Janner 2008; Crow, Benham, Devereux and Amable 2007; Chase et al., 2011; cited in Challis, Forlin and Kincey 2011: 279). Significant studies have devised new analytical techniques – for example, multivariate analysis of shaded relief images (Devereux, Amable, Crow and Cliff 2008) and modelling of local relief (Hesse 2010) – or have cleverly adapted established methods of topographic analysis aimed at non-archaeological ends to provide new insights into landscape; for example, the use of the sky-view factor outlined by Kokalj, Zakšek and Oštir (2011). Likewise, I will use LiDAR to create lightscapes for archaeological purposes.

For the following study, I used LiDAR DTMs with a 2m resolution for Shetland and a 5m resolution for Orkney, which are the most highly detailed LiDAR DTMs I could attain for both these areas, gathered from the Landmap online mapping system. However, it should be noted that although the DTMs for Orkney (5m) do not have the same degree of resolution as those of Shetland (2m), they are still of sufficient detail to give a true depiction of light and shadow in the landscape, and are thus worthy for this analysis (though anything higher than a 5m resolution should not be used). The primary aim of using this data was to identify areas exposed to direct sunlight during specific time periods and to then ask whether the positioning of Iron Age brochs and the orientation of their entrances were influenced by the contrasting and fluctuating lightscapes that sculpt and change these landscapes throughout the day and year.

Obviously, this task is a challenging one as the nature of light is one that is transitory, variable, and thus difficult to measure and capture, even in small locales. There is, however, a method to achieve it.

After these DTMs were obtained, what was then required was the exact position of the sun at different times of the day and year as it is viewed from any one site. The first challenge was thus to calculate the elevation and azimuth of the sun repeatedly throughout the day in nominal increments; thereby gaining a wide understanding of how the sun affects the local topography of a single site at any one time. To do this, I used the National Oceanic and Atmospheric Administration (NOAA) solar calculator internet-based tool which calculates solar position (elevation and azimuth) for any latitude and longitude in the world, during any specific time of the day and year. Entering the coordinates of each individual site, the calculator was then able to provide me with the solar measurements I required, which, in turn, I used in ArcGIS in conjunction with the high quality DTMs to create illuminated maps that mimic the nature of light and shadow in the landscape.

Using the DTMs which I had already gathered, I used the hillshade tool in ArcGIS; a feature that obtains the hypothetical illumination of a surface by determining illumination values for each cell in the DTM, and creating in the process a visualisation mimicking the natural landscape. I first entered the elevation and azimuth data for a particular site at a particular time of day throughout the year. For example, I calculated that at 13:00 PM on the winter solstice (21st December), at the broch of Mousa, the sun's elevation is 5.89°, whereas its azimuth is 193.17°. These calculations can then be inputted into the hillshade tool which then produces a map that considers both local illumination angles and shadows based on the map surface and the parameters regarding the position of the sun in the sky.

In the process, a detailed raster map is created upon which the areas of shadow and light in the landscape are depicted; and this map is made up of shades of grey associated with integers from 0 to 255 (increasing from black to white). This means that raster cells (which make up the DTM) which are in shadow are assigned a value of zero, whereas cells in the most sunlight are given a value of 255. This creates the shade and illumination which can be seen on the map and which mimics real light effects. To create a raster of the shadow areas only however, I used the 'Reclassify Tool' to separate the value zero from the other values. By removing all the cells between 1 and 255 (i.e. the cells that represent degrees of sunlight), I was left with a map that only reveals the areas of shadow in the landscape. Therefore, I am left with an accurate measurement of shadow and direct sunlight around any particular site of my choosing for any time and date of the year.

For every selected broch, I chose three dates of the year on which to calculate these lightscapes – the winter solstice (21st December), the summer solstice (21st June), and the spring equinox (21st March), which also roughly equates to the light effects during the autumn equinox too (21st September). Lightscape maps were created for different times of those days; for example, for the winter solstice at the broch of Mousa, lightscape maps were created for these times: 09:10 AM (sunrise), 09:20 AM, 09:45 AM, 10:00 AM, 11:00 AM, noon, 13:00 PM, 14:00 PM, 14:30 PM, and at 14:45 PM (sunset); each time representing an individual map depicting shadow and direct light around that one site.

I should state here, however, that for the most part, the methodology enlightens upon whether an entrance sought to admit *direct* sunlight or not. It should be noted that if direct sunlight did not enter the broch, it does not necessarily entail that a degree of ambient light did not also enter; something which a GIS methodology would not inform upon. Indeed, even a northern entrance (which would gain no direct sunlight throughout the year) would admit at least some ambient light. One should thus bear in mind that, in the case studies below, if a broch is depicted in the shade while the remaining landscape remains in direct sunlight, the broch – though in the shade – may have still retained at least some ambient, if not direct, sunlight.

With regards to selected sites, I chose 23 brochs from Shetland, and 23 from Orkney, with confident and 'probable' entrances, as opposed to sites in which the entrance was uncertain. For the analysis of these brochs then, I will progress through them according to their orientation, beginning with those sites possessing doorways facing the north-east and moving clockwise to the east, then to the south and finally, to the brochs with west and north-west facing entrances.

For each site, I have also included a brief viewshed analysis. Viewshed analysis has been used in a wide range of applications, including locating telecommunication relay towers (De Floriani, Marzano and Puppo 1994), locating wind turbines (Kidner, Sparkes and Dorey 1999), protecting endangered species (Camp, Sinton and Knight 1997), evaluating urban environment planning (Lake, Lovett, Bateman and Langford 1998), optimal path route planning (Lee and Stucky 1998), and analysing archaeological locations (Lake, Mithen and Woodman 1998). Within archaeology, viewshed analysis has mainly been used as a method by which one can explore the factors governing settlement and monument location (Renfrew 1979; Fraser 1983; Kvamme 1993; Wheatley 1995; Lock and Harris 1996; Maschner 1996); a concept often centred on the idea of field-of-view and line-of-sight (Gillings and Wheatley 2002). For this study however, I have conducted viewshed analysis to better understand site positioning, permitting me to compare topographic concerns relating to line-of-sight with the added requirement for both shelter and light.

The Shetland Islands

Figure 5.8. Location of Shetland's Brochs with available entrances to be analysed. *(Hollow circles represent other brochs without available entrance data).*
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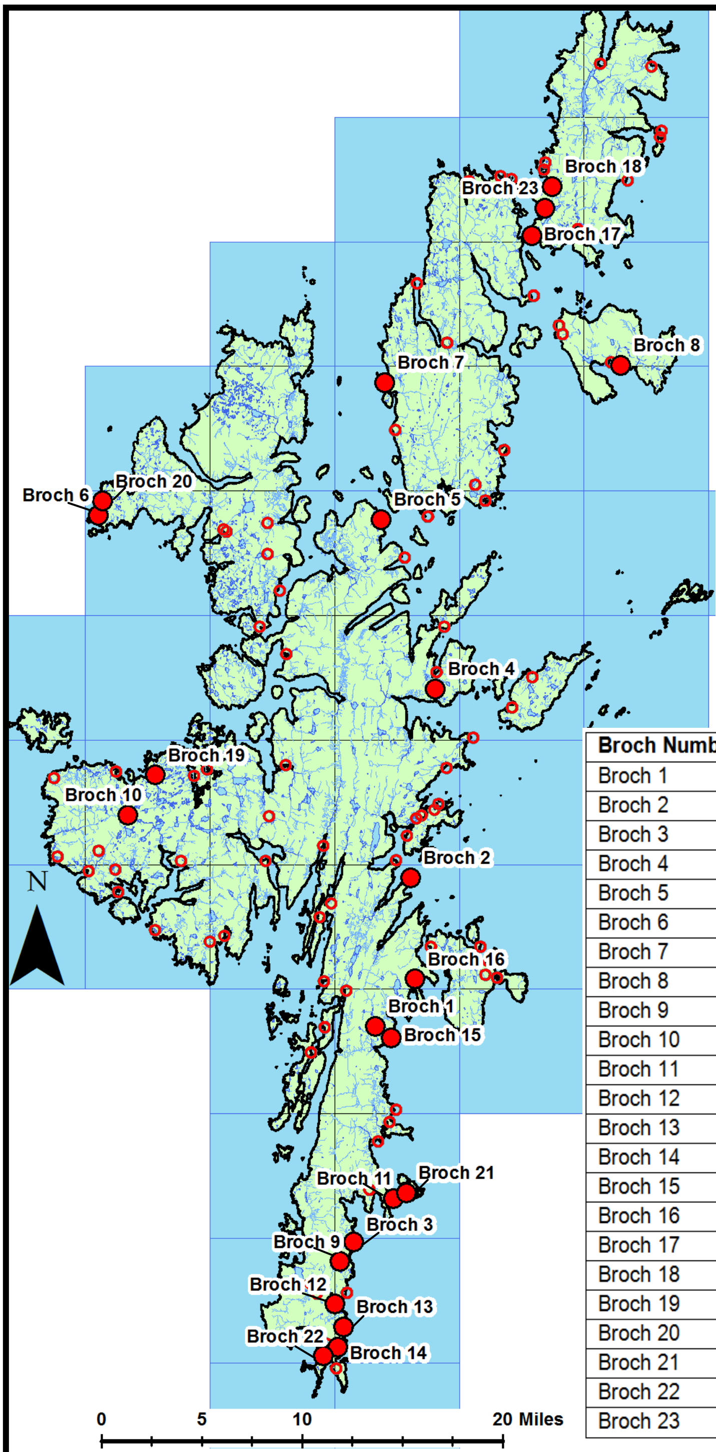


Broch Number	Site Name	Orientation
Broch 1	Loch Of Brindister	NNE
Broch 2	Hawks Ness	NE
Broch 3	Levenwick	E
Broch 4	Burga Water (2)	E
Broch 5	Fugla Ness	E
Broch 6	Sae Breck	E
Broch 7	The Brough	E
Broch 8	St Rognvald's	E
Broch 9	Clumlie	SE
Broch 10	Burga Water (1)	S
Broch 11	Burraland	SW
Broch 12	Southvoe	SW
Broch 13	Clevigarth	SW
Broch 14	Brough Head	SW
Broch 15	Burland	SW
Broch 16	Clickimin	SW
Broch 17	Hoga Ness	SW
Broch 18	Underhoull	SW
Broch 19	West Burra Firth	WSW
Broch 20	Loch Of Houlland	WSW
Broch 21	Mousa	W
Broch 22	Sumburgh Airport	WNW
Broch 23	Loch Of Snabrough	NW

Broch 1: Loch of Brindister

Canmore ID: 1002

Entrance: NNE

The Broch and its Landscape Context

This broch (Figures 5.9 and 5.10), situated on a small islet on the Loch of Brindister, was partially excavated in 1888 (Goudie 1889). Surrounded on at least three sides by hills, the view from the structure is limited (Figure 5.11). It has no line of sight to any other broch; however, it does have a full view of the loch itself and of the surrounding shore and hills. Though many other island brochs are situated quite close to the shore, this structure is situated almost centrally within the loch.

The Winter Solstice (21st December) – Figures 5.12 and 5,13.

This broch is notable as it seems to have had an entrance towards the NNE, which is a rare trait for Iron Age sites across much of Iron Age Scotland, except for the duns located in Argyll (Crowther 2011). With its NNE entrance, this broch would not have gained any direct sunlight throughout the winter. Indeed, with regards to light, this a functionally illogical orientation throughout much of the year.

At sunrise, the broch and the loch that surrounds it are in the shade, but ten minutes afterwards, the broch receives direct sunlight on its SE side, and would have continued to gain this here until around noon when the sun went into the western sky. The SW side of the broch then benefits from sunlight until just before 14:00 PM, when the loch and the broch lose light, probably over an hour before sunset. In this way, an eastern entrance would certainly gain more light, but the choice of a NNE entrance remains illogical.

The Equinox (21st March) – Figures 5.14 and 5.15

Due to the eastern hills that surround the loch, the site doesn't receive light until around 06:20 AM, about fifteen minutes after sunrise. The eastern side of the broch would have received light for the rest of the morning. The western half of the broch would then gain light until between 17:30 PM and 18:00 PM, probably losing light about forty minutes before sunset. However, the NNE entrance would still only have gained a little ambient light (not direct light), in the first hour of daylight, before then losing light for the remainder of the day.

The Summer Solstice (21st June) – Figures 5.16, 5.17 and 5.18

The summer, and especially around the solstice, would be the only time that the entrance gained direct sunlight, something which suggests that the solstice may have been marked here. However, at sunrise (without daylight saving) the broch does not gain direct sunlight, and it is not until just after 03:30 AM, about forty minutes after sunrise, that the broch does gain light. The entrance would probably receive minimal light for the next couple of hours before the sun moved out of the north and into the eastern and south-eastern sky. The site remains in light, as does the loch that surrounds it, until about 20:30 PM, when shadow encroaches on the loch, and by 21:00 PM, the broch is in the shade, at least half an hour before sunset.

Conclusion

As noted, the NNE entrance is only suited to the time around the summer solstice, and even then, the fact that the broch does not receive direct light until forty minutes after sunrise means that this entrance would receive little direct light even at this time of the year. As noted, an entrance towards the SE would have been optimal for this site, protected from the wind by the low lying hills to the east and west, but still gaining the maximum amount of light throughout much of the year. For this site then, an explanation other than light availability and shelter from the wind should be sought.

Figure 5.9. Loch of Brindister Broch.
Author's Photo.

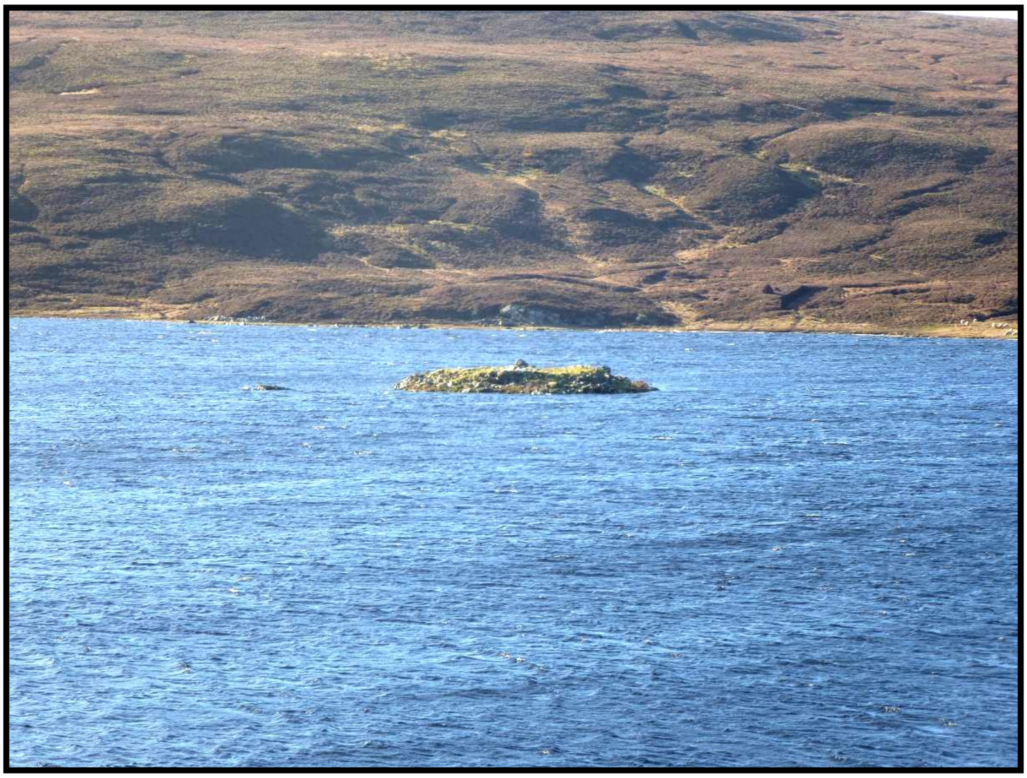
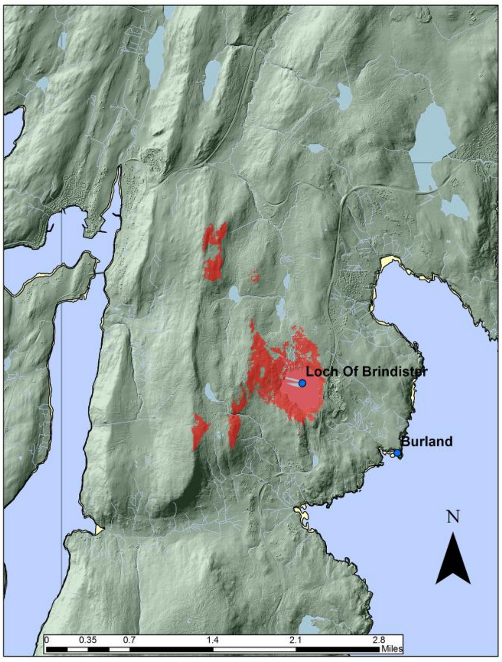
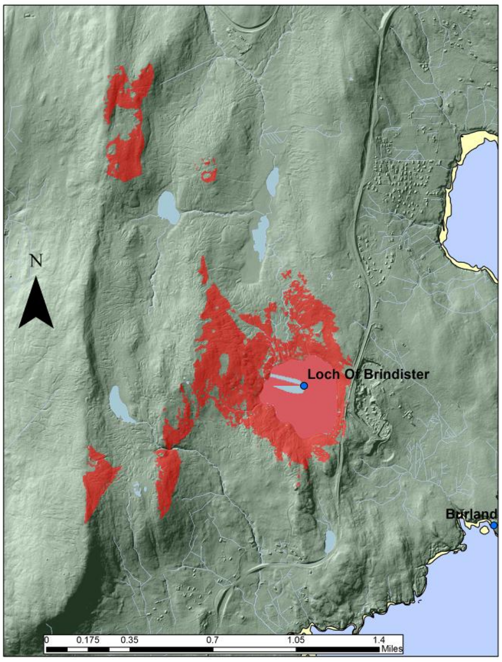


Figure 5.10. View towards the Loch of Brindister Broch, taken from the east. *Author's Photo.*

Figure 5.11. Multiple Viewsheds of Loch of Brindister Broch.





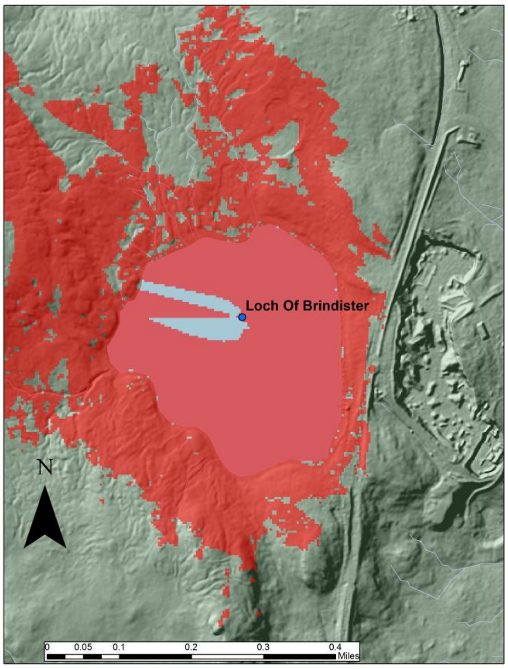


Figure 5.12. Sunrise (09:10 AM) to 14:15 PM around Loch of Brindister on the Winter Solstice (21st December). Red areas denote areas of shadow.

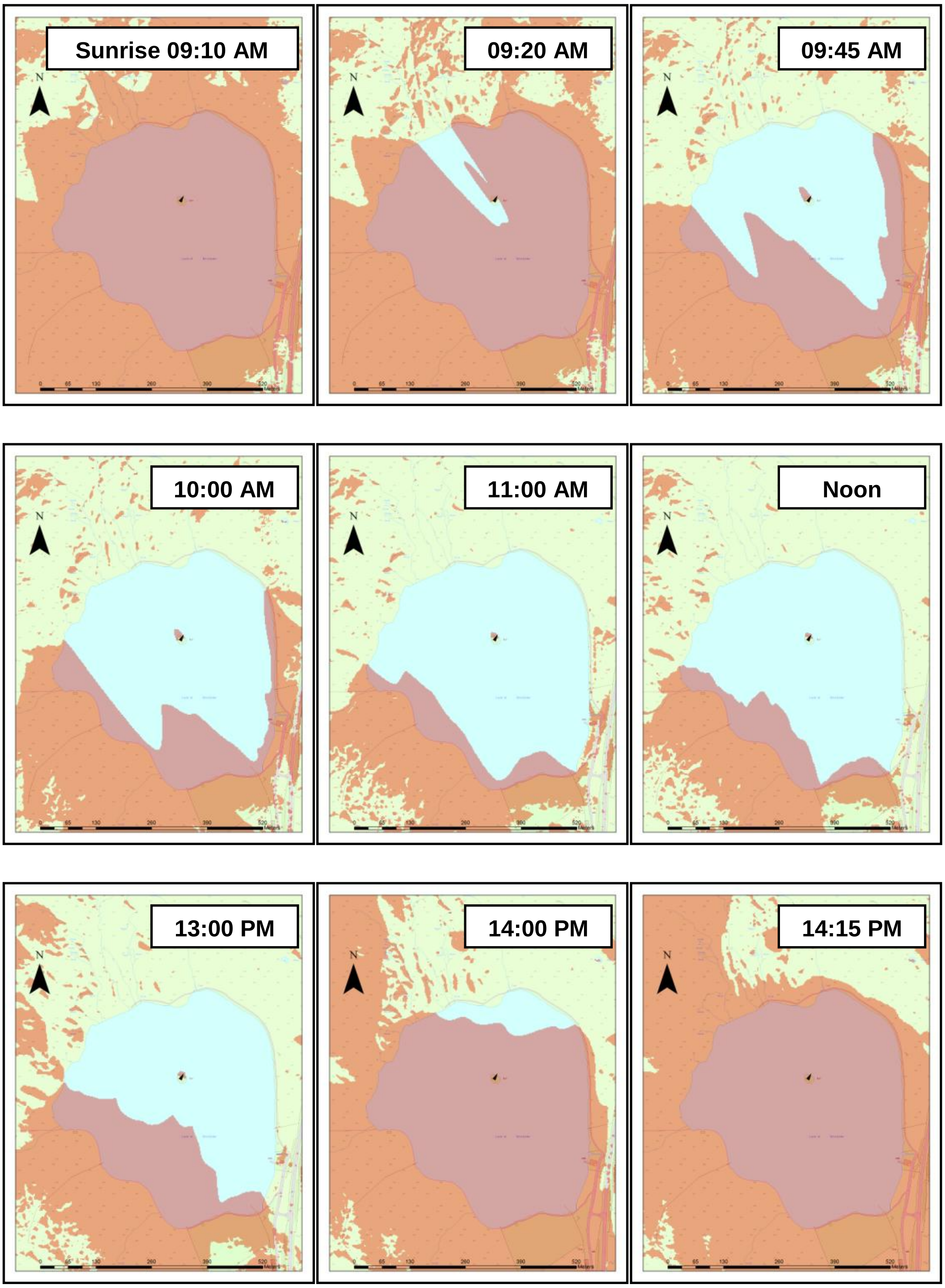


Figure 5.13. 14:30 PM to Sunset (14:55:45 PM) around Loch of Brindister on the Winter Solstice (21st December). Red areas denote areas of shadow.

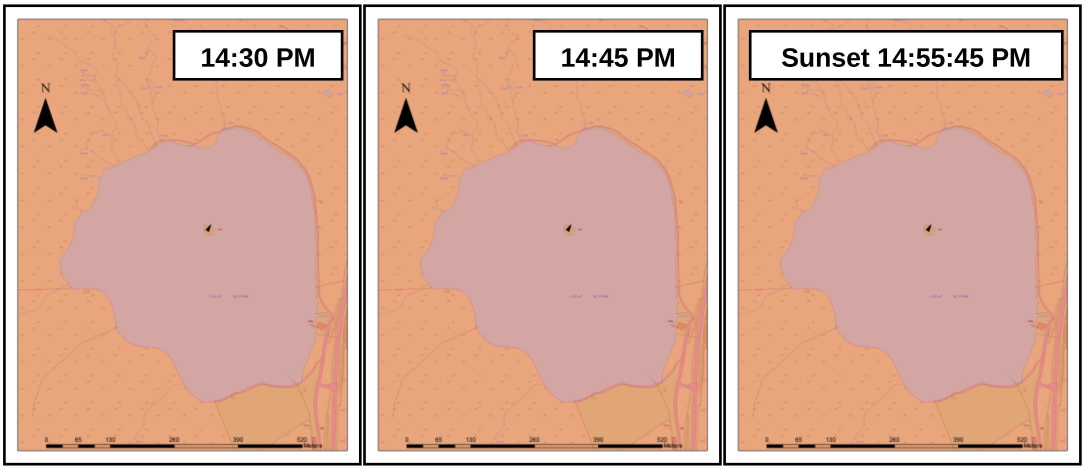


Figure 5.14. Sunrise (06:05:10 AM) to Noon around Loch of Brindister on the Spring Equinox (21st March). Red areas denote areas of shadow.

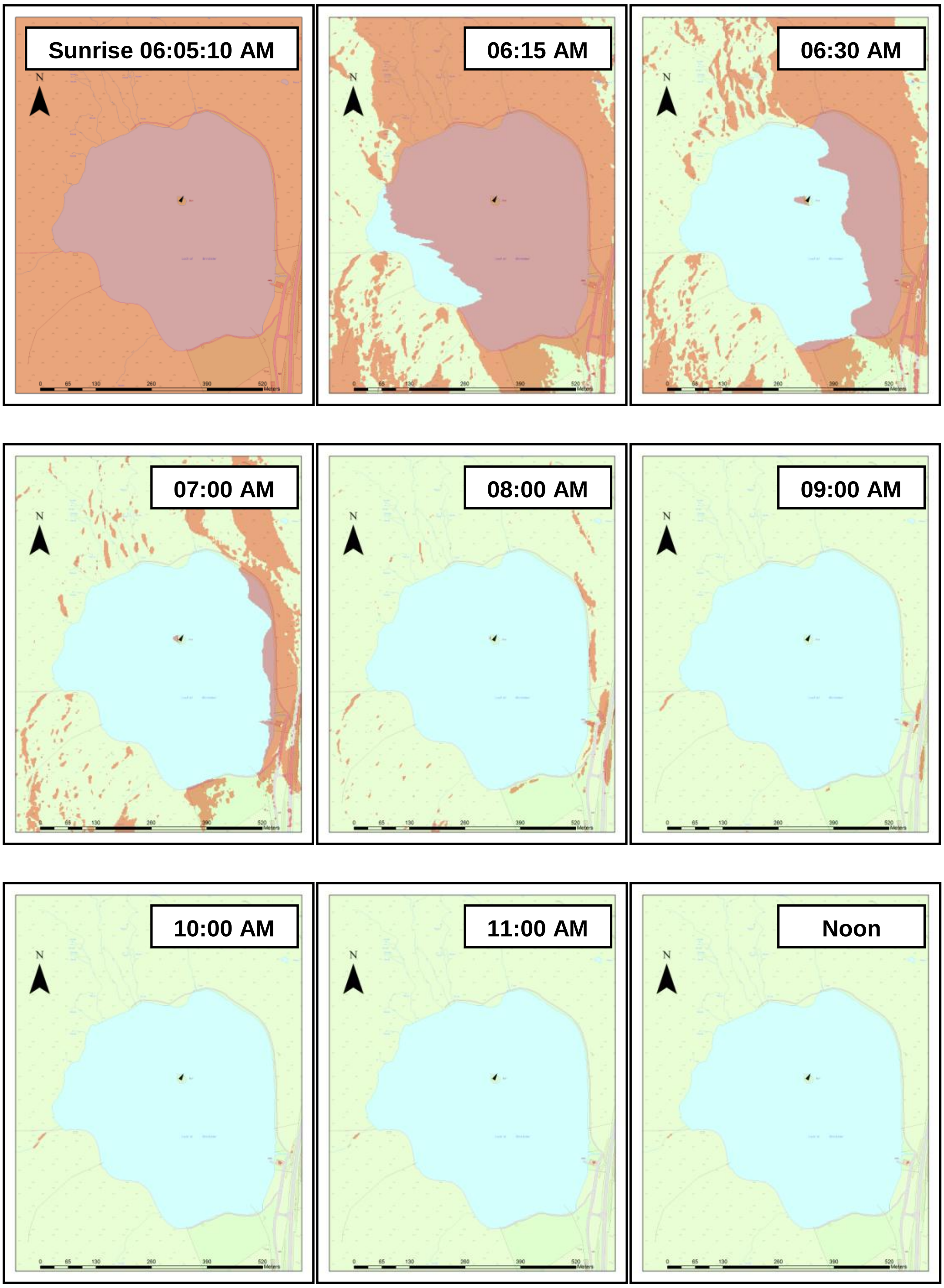


Figure 5.15. 13:00 PM to Sunset (16:19:50 PM) around Loch of Brindister on the Spring Equinox (21st March). Red areas denote areas of shadow.

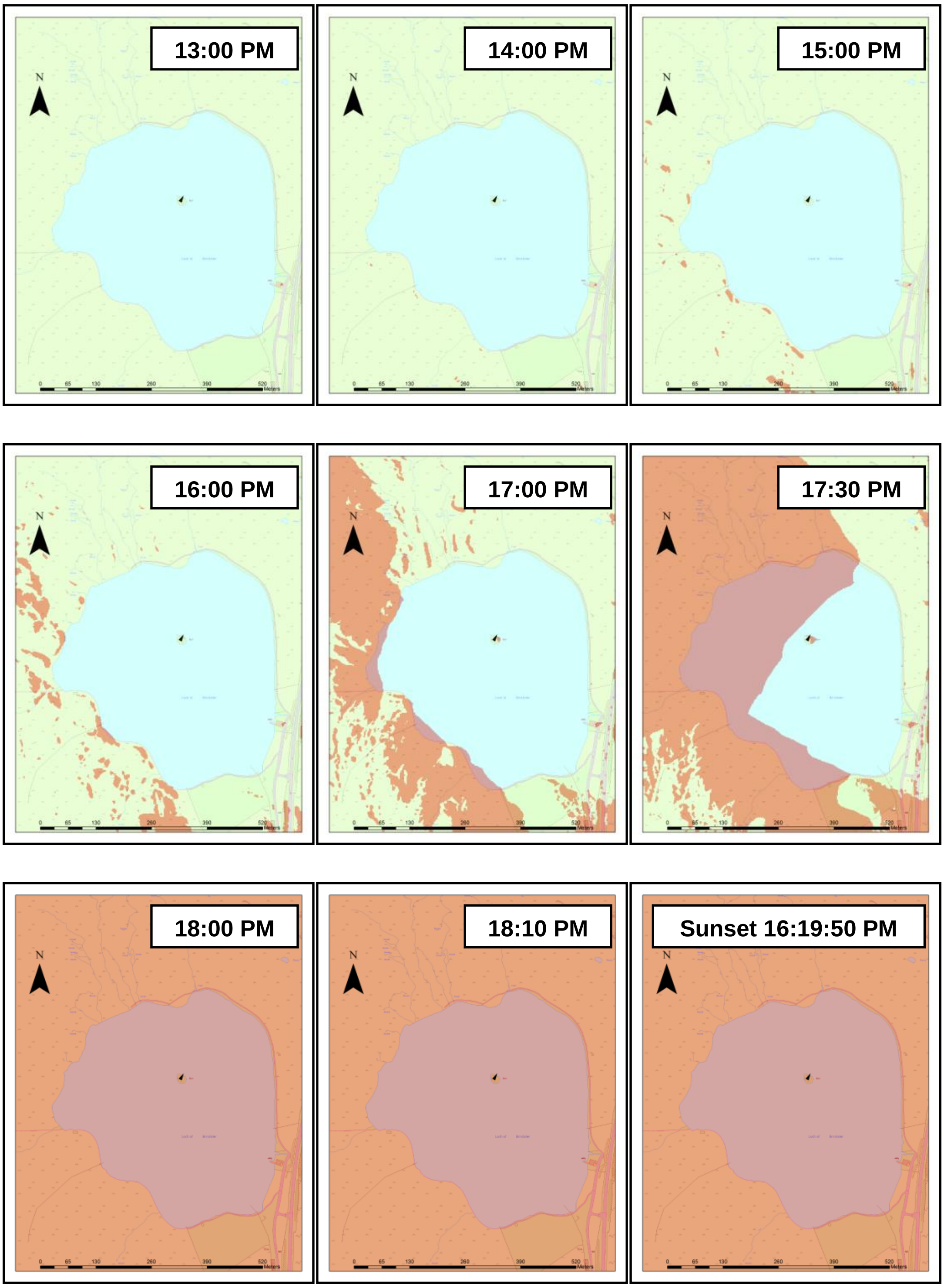


Figure 5.16. Sunrise (02:44:10 AM) to 09:00 AM around Loch of Brindister on the Summer Solstice (21st June). Red areas denote areas of shadow.

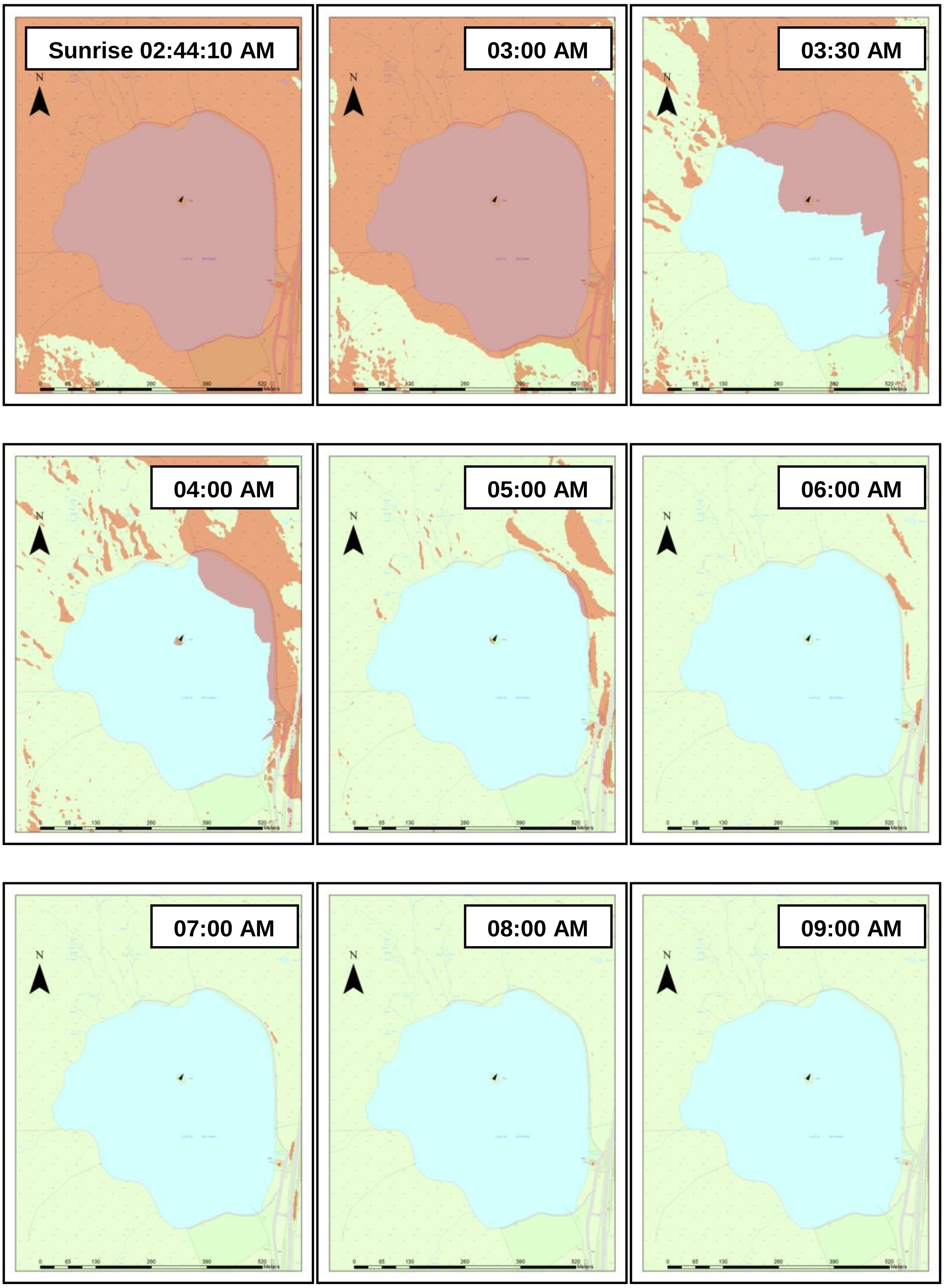


Figure 5.17. 10:00 AM to 18:00 PM around Loch of Brindister on the Summer Solstice (21st June). Red areas denote areas of shadow.

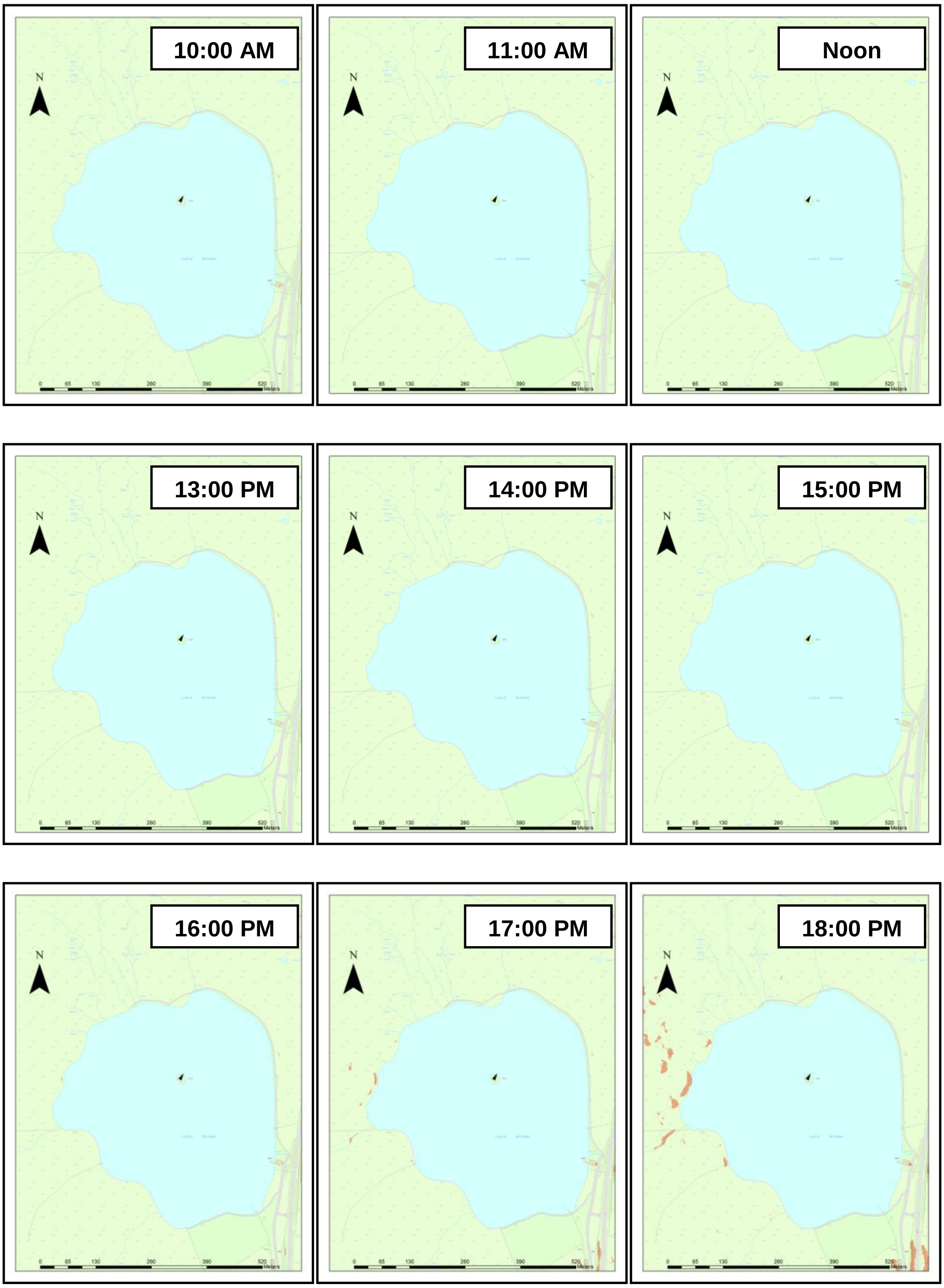
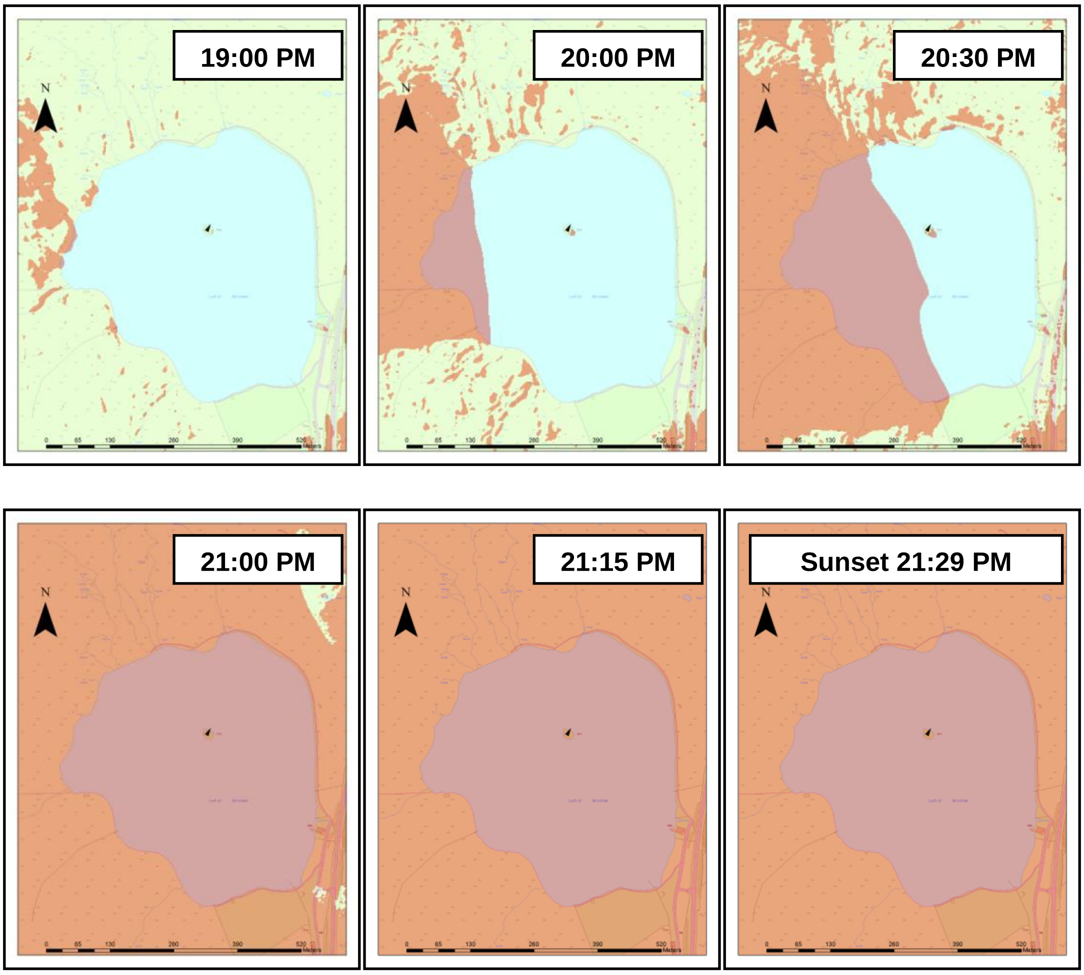


Figure 5.18. 19:00 PM to Sunset (21:29 PM) around Loch of Brindister on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 2: Hawk's Ness

Canmore ID: 1016

Entrance: NE

The Broch and its Landscape Context

Situated on a spit of high cliffs which extend out into the North Sea, Hawk's Ness (Figure 5.19) is one of the prominent brochs in Shetland. It has far ranging views of the Shetland Mainland and Bressay (Figure 5.20), and has a near 320° view of the sea in almost all directions, while also commanding the entrance to the harbour of Cat Firth to the north. This suggests that the broch was built to be seen, especially from the seaward side. Indeed, for any boat travelling northwards out of Bressay Sound, this broch would have been visible. However, it does not have a line-of-site with any other broch, apart from Aith and Brough on Bressay, far to the south.

The Winter Solstice (21st December) – Figures 5.21 and 5.22

Much like Loch of Brindister (Broch 1), Hawk's Ness faces the NE and its entrance thus only captures direct sunlight during midsummer.

During winter, due to its location overlooking the eastern coast, the broch receives light only about ten minutes after sunrise, at 09:22 AM, and continues to receive light for much of the day. Due to the rugged nature of the landscape around the broch, many areas are dotted in shadow throughout the day however. The headland position of Hawk's Ness also means that although much of the landscape is in shadow by around 14:15 PM, the broch is able to gain sunlight until till around 14:30 PM, though it loses light about twenty minutes before sunset. This means that the SE and SW sides of the broch would have been much better choices for an entrance during the winter.

The Equinox (21st March) – Figures 5.23 and 5.24

At the outset of spring and autumn, the broch would have received easterly light immediately as the sun rose. However, the entrance facing NE however would barely gain any direct light, even at sunrise.

Again, the eastern, southern and western parts of the broch would have been illuminated at different times of the day. Like in winter, the broch maintains sunlight for much of the afternoon, and when the rest of the landscape is in shadow, the western side of the broch would still have gained light until about 18:07 PM, about twenty minutes before sunset. This demonstrates that a due east or due west orientation would have been more beneficial.

The Summer Solstice (21st June) Figures 5.25, 5.26 and 5.27

The NE entrance is best suited to the midsummer period, and may have been influenced by the midsummer solstice. At sunrise, the broch and entrance remain in shadow. It is not until 03:00 AM that the entrance receives some light, about twenty minutes after sunrise. From then until around 09:00-10:00 AM, the NE entrance would have received direct sunlight, gaining between six and seven hours of direct light. All sides of the broch receive light throughout the day due to the sun's high summer position, but by 21:00 PM, shadow begins to encroach on it, with the site losing light between 21:00 PM and 21:15 PM, at least fifteen minutes before sunset.

Conclusion

For this site, an eastern entrance would have been best. For much of the year, an orientation towards the SE would have been the better choice however, especially during winter. But with regards to all-year round light, a due-east orientation may have been better yet, avoiding the prevailing winds. The NE orientation, only illuminated during midsummer mornings, suggests it was not winter or spring sunlight that was wanted, and nor was it afternoon light either; something that was available at this site. Being somewhat effected by the cold north-easterly winds, especially on this headland, it may be this NE entrance – facing away from the mainland – was a defensive choice, though such a theory seems unlikely (as explored in Chapter Four), and is generally a rule not followed by other coastal brochs.

Figure 5.19. View towards Hawk's Ness Broch, taken from the south-west. *Author's Photo.*

Figure 5.20. Multiple Viewsheds of Hawk's Ness Broch.

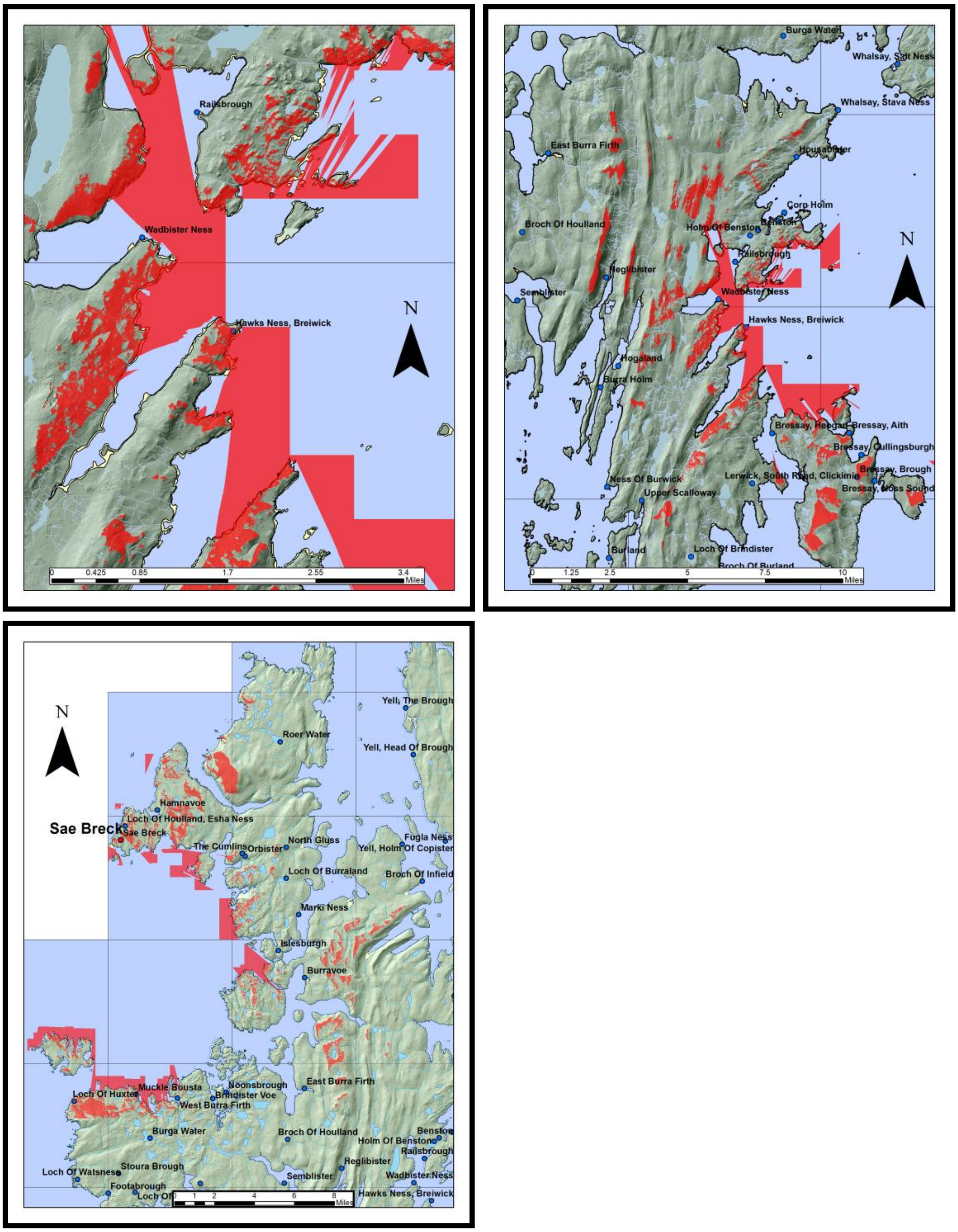


Figure 5.21. Sunrise (09:12:40 AM) to 14:00 PM around Hawk's Ness on the Winter Solstice (21st December). Red areas denote areas of shadow.

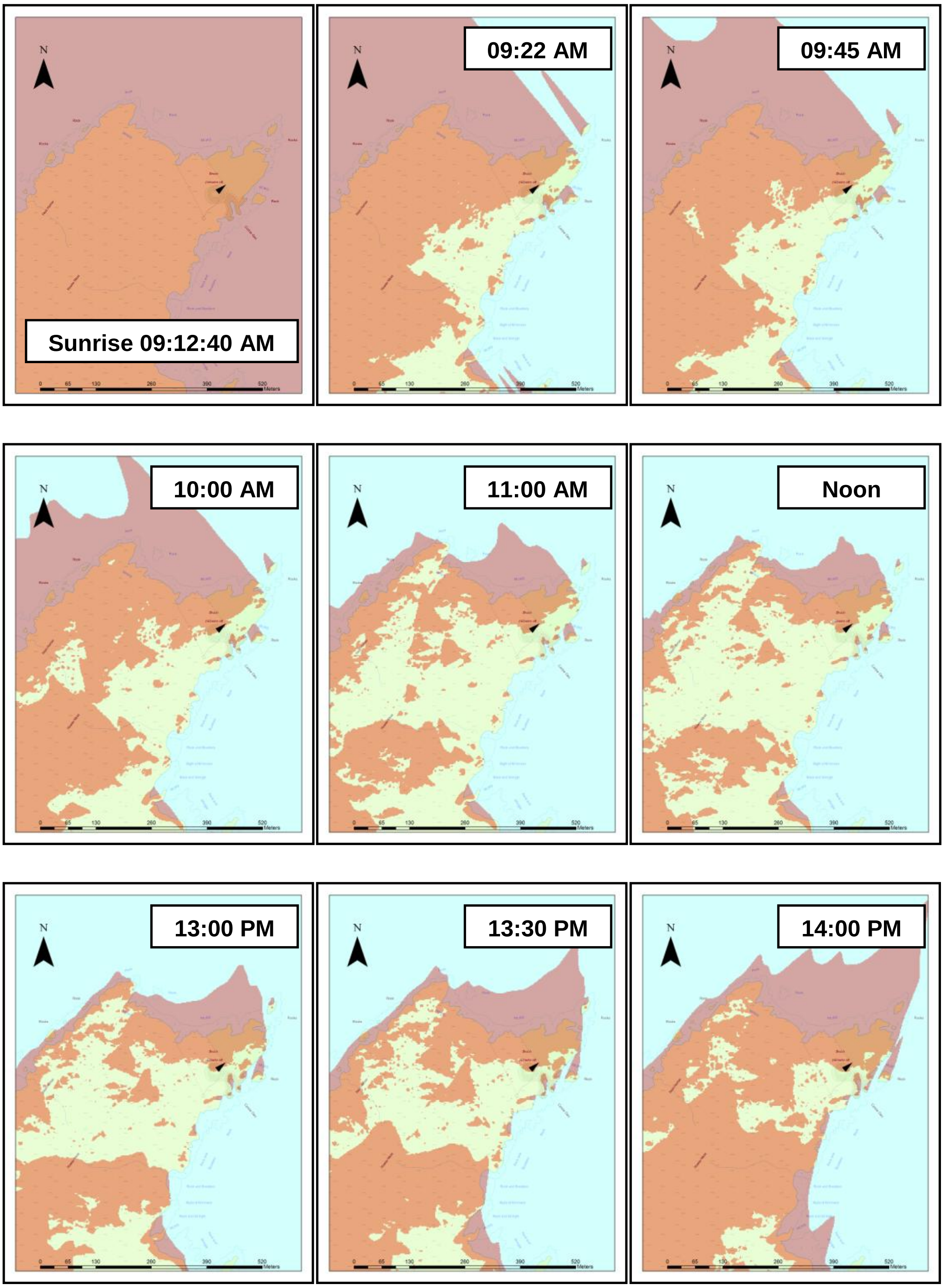


Figure 5.22. 14:15 PM to Sunset (14:53:10 AM) around Hawk's Ness on the Winter Solstice (21st December). Red areas denote areas of shadow

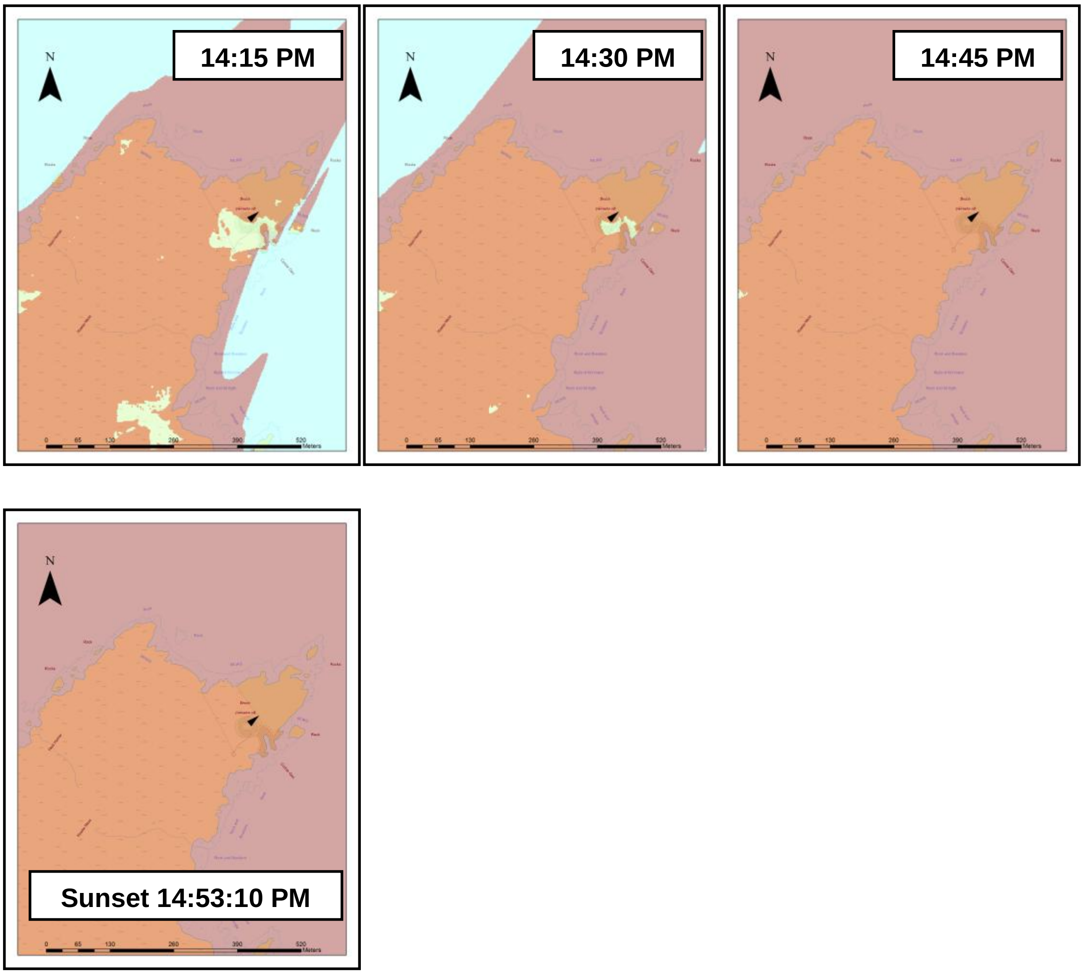


Figure 5.23. Sunrise (06:05:05 AM) to Noon around Hawk's Ness on the Spring Equinox (21st March). Red areas denote areas of shadow.

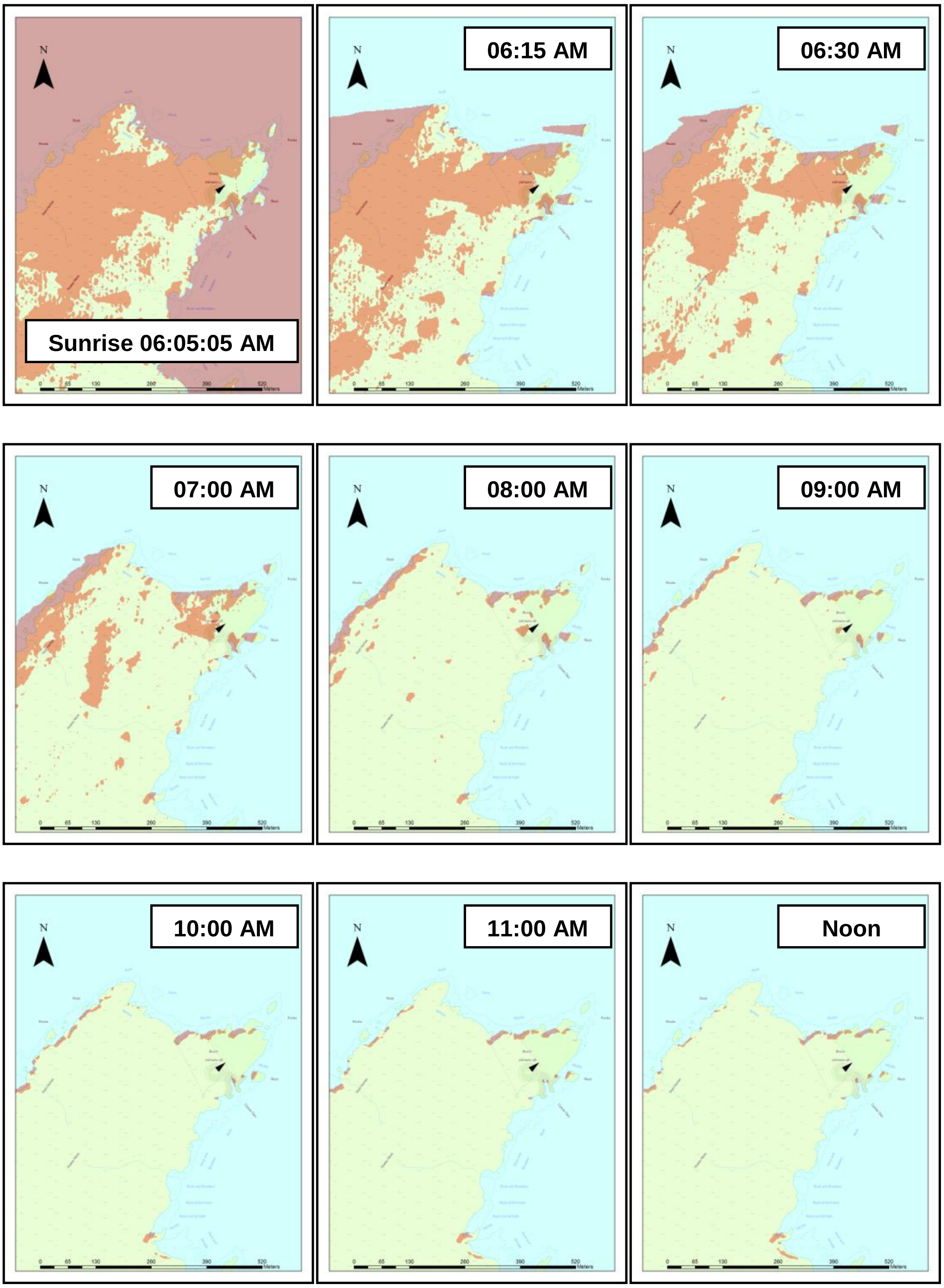


Figure 5.24. 13:00 PM to Sunset (18:19:55 PM) around Hawk's Ness on the Spring Equinox (21st March). Red areas denote areas of shadow.

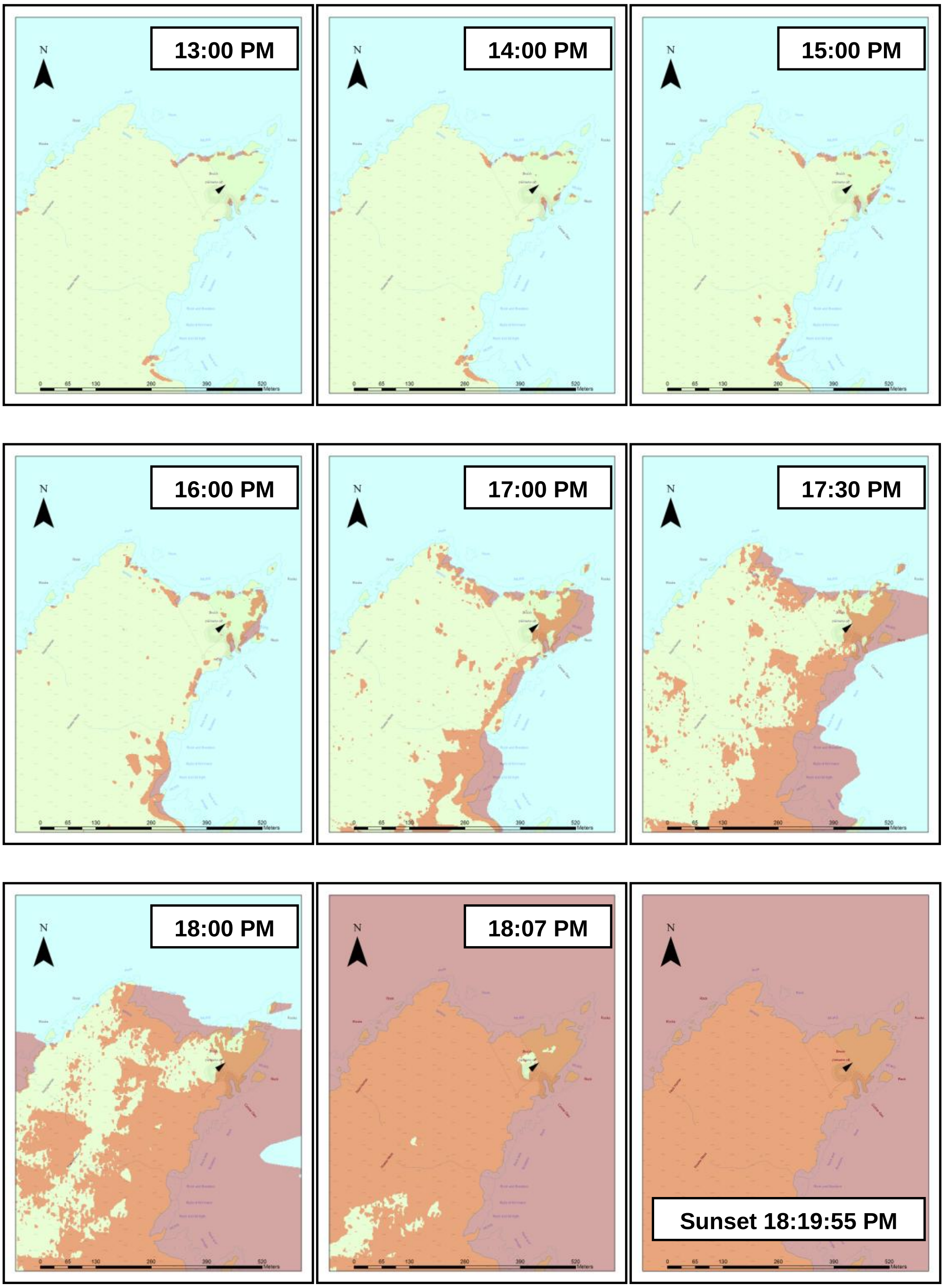


Figure 5.25. Sunrise (02:41:20 AM) to 08:00 AM around Hawk's Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.

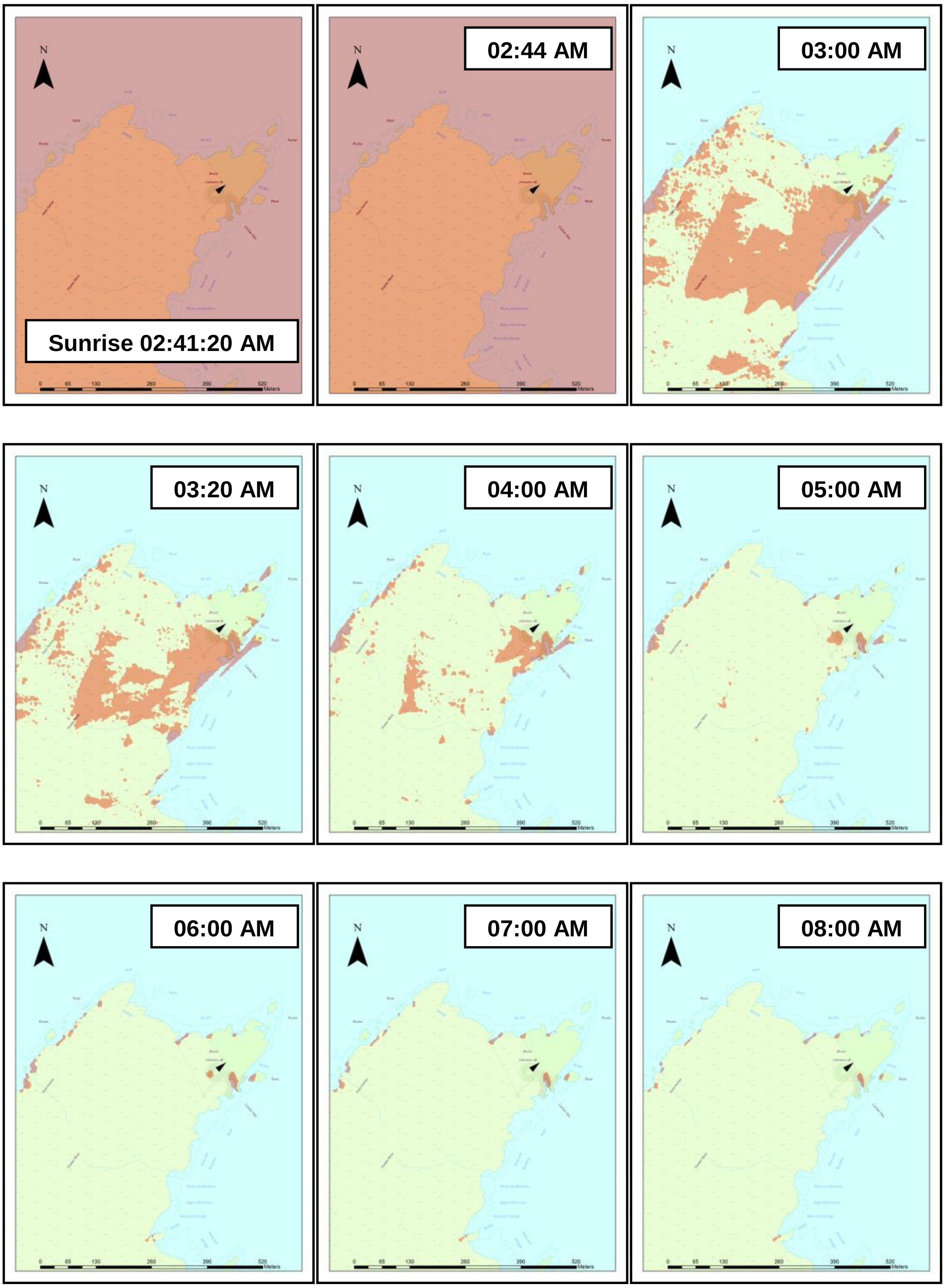


Figure 5.26. 09:00 AM to 17:00 PM around Hawk's Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.

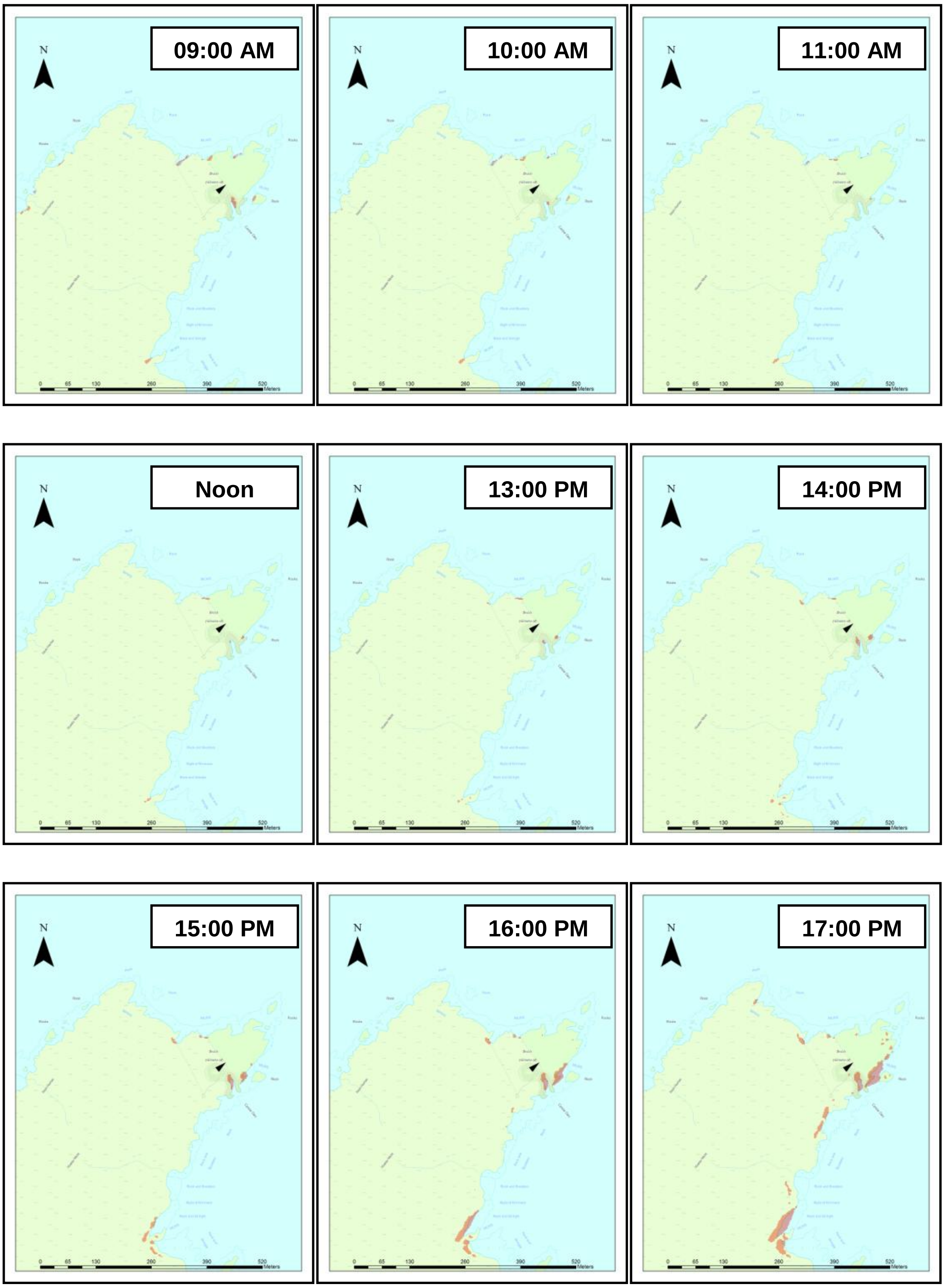
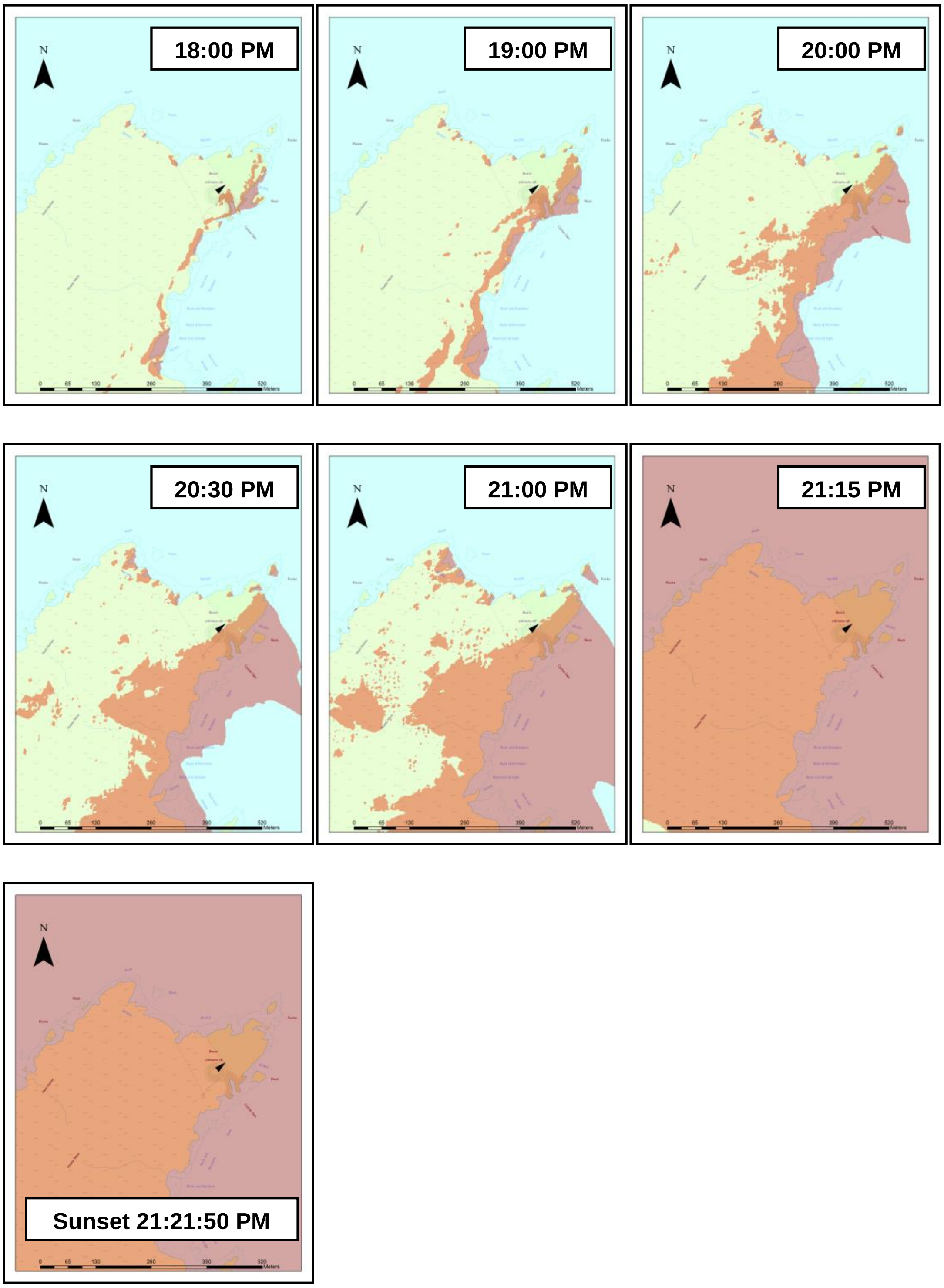


Figure 5.27. 18:00 PM to Sunset (21:21:50 PM) around Hawk's Ness on the Summer Solstice (21st June). Red areas denote areas of shadow



Broch 3: Levenwick

Canmore ID: 908

Entrance: E

The Broch and its Landscape Context

Levenwick broch (Figures 5.28 and 5.29) is located on flat ground, near the cliffs that on the east coast of the Dunrossness peninsula. It is positioned at the foot of fertile land which slopes down towards the coast, with the broch located on a more or less flat strip of next to the sea. Excavated by Goudie (1873; 1904: 14) in 1869, Levenwick's eastern entrance faces the sea, and as the site is located on a flat plane, it generally receives sunlight throughout the year. Further, as can be seen in Figures 28 and 30, the site has fantastic views of the sea, and again, the sea, rather than the land (or other brochs), was the object of attention.

The Winter Solstice – Figures 5.31 and 5.32

At sunrise, the eastern side of the broch is one of the first locations in the landscape to receive sunlight, and by 10:00 AM, much of the surrounding land is also in direct light. By noon, the entrance would have lost direct sunlight, but still, the landscape around the broch receives light until around 14:00 PM. This means that the western side of the broch receives slightly less direct sunlight, as the landscape around it remains in shadow from just after 14:00 PM, around forty-five minutes before sunset. This means that the eastern entrance would receive more light than a western entrance during this time of year.

The Equinox (21st March) – Figures 5.33 and 5.34

Again, as the sun rises, the eastern entrance of the broch is immediately illuminated. By 06:30 AM, much of the landscape around the broch is in sunlight, and remains so for much of the day. By 15:00 PM, the eastern entrance loses sunlight, and by 17:30 PM, the western hills once again obscure the setting sun, meaning that a western entrance would lose about half an hour more of sunlight than the eastern entrance does.

The Summer Solstice (21st June) Figures 5.35, 5.36 and 5.37

As the sun rises at 03:00 AM, the eastern entrance of the broch receives direct sunlight, though much of its surrounding landscape remains in shadow. But by 04:00 AM the majority of the landscape is in direct sunlight, and remains so for the day. By 18:00 PM, much of the eastern side begins to fall into shadow, and due to the western hills, any western entrance would have been limited as the sun falls behind them at least thirty minutes before sunset.

Conclusions

With the sun on the eastern and south-eastern side of the broch in the morning, the reflectance off the sea would have emphasised the illumination of the landscape and of this side of the broch, meaning that its eastern entrance certainly receives more light than a western entrance. Also, a western entrance would receive slightly less light than the eastern due to the western hills. However, a south-eastern entrance would have been ideal with regards to gaining the maximum amount of light, especially during the winter, and it is assumed that this was avoided because of south-easterly winds coming off the sea.

Figure 5.28. View towards Levenwick. *Author's Photo.*

Figure 5.29. Ground Plan of Levenwick Broch. (After Goudie 1873: 214; fig. 2).

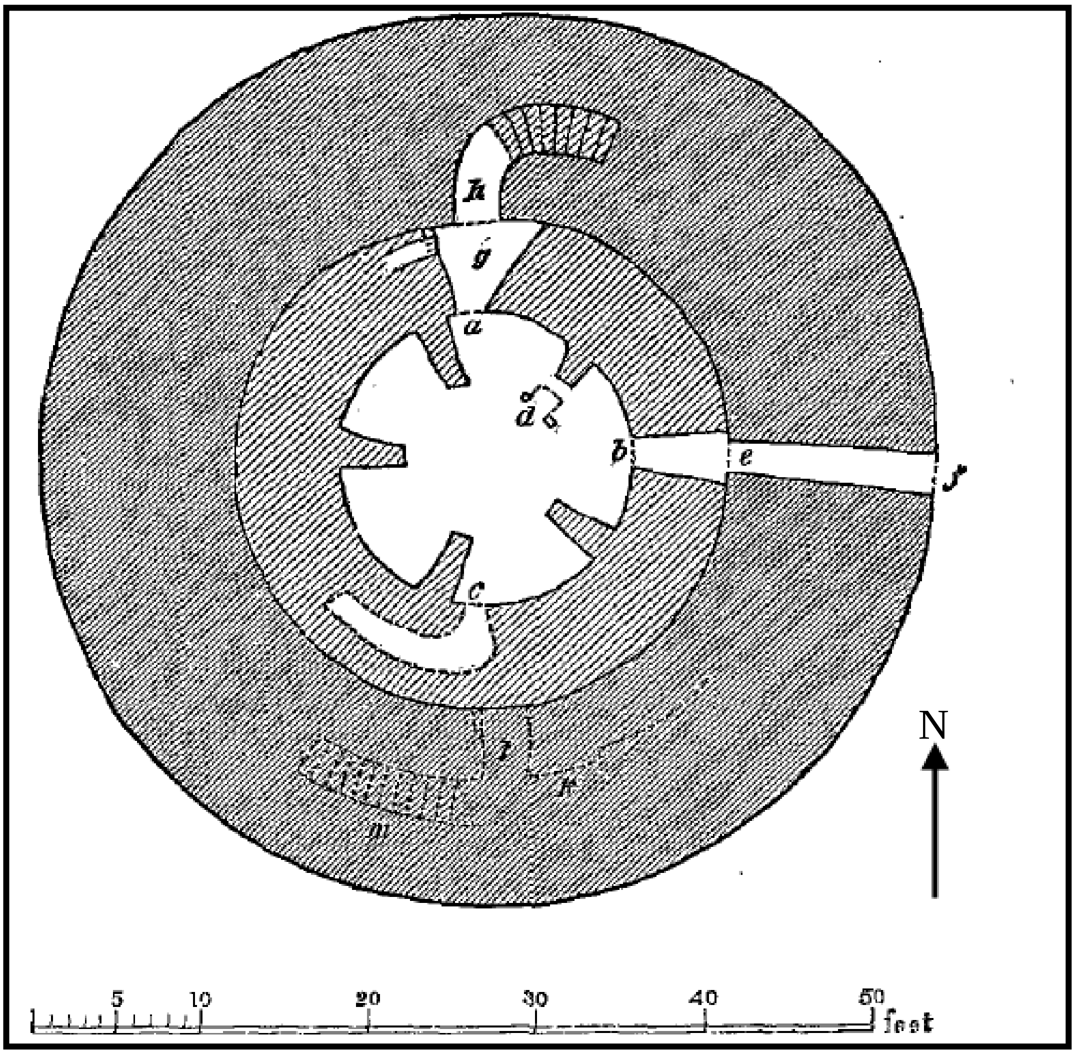
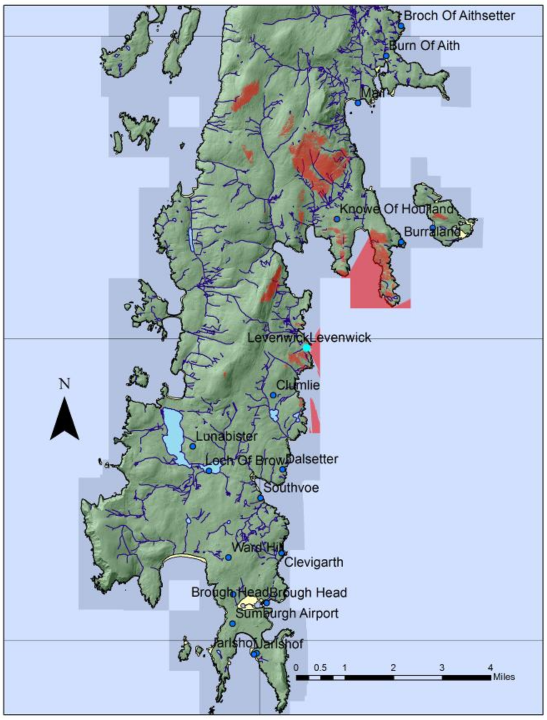


Figure 5.30. Multiple Viewsheds of Levenwick Broch.



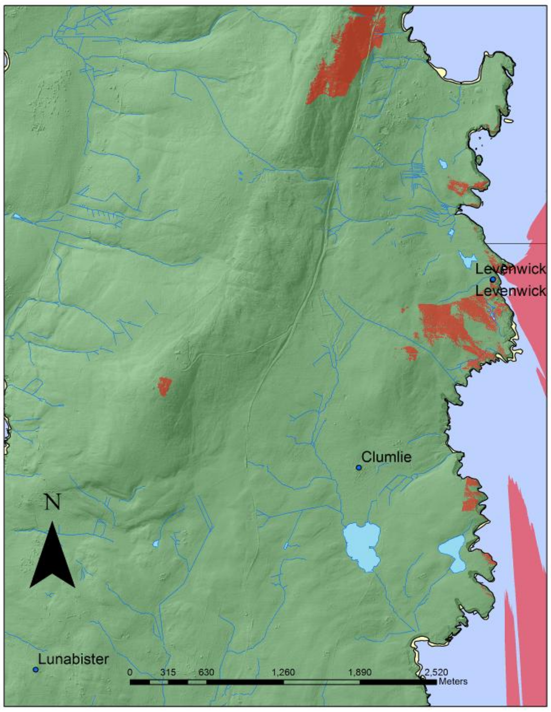


Figure 5.31. Sunrise (09:10 AM) to 14:30 PM around Levenwick on the Winter Solstice (21st December). Red areas denote areas of shadow.

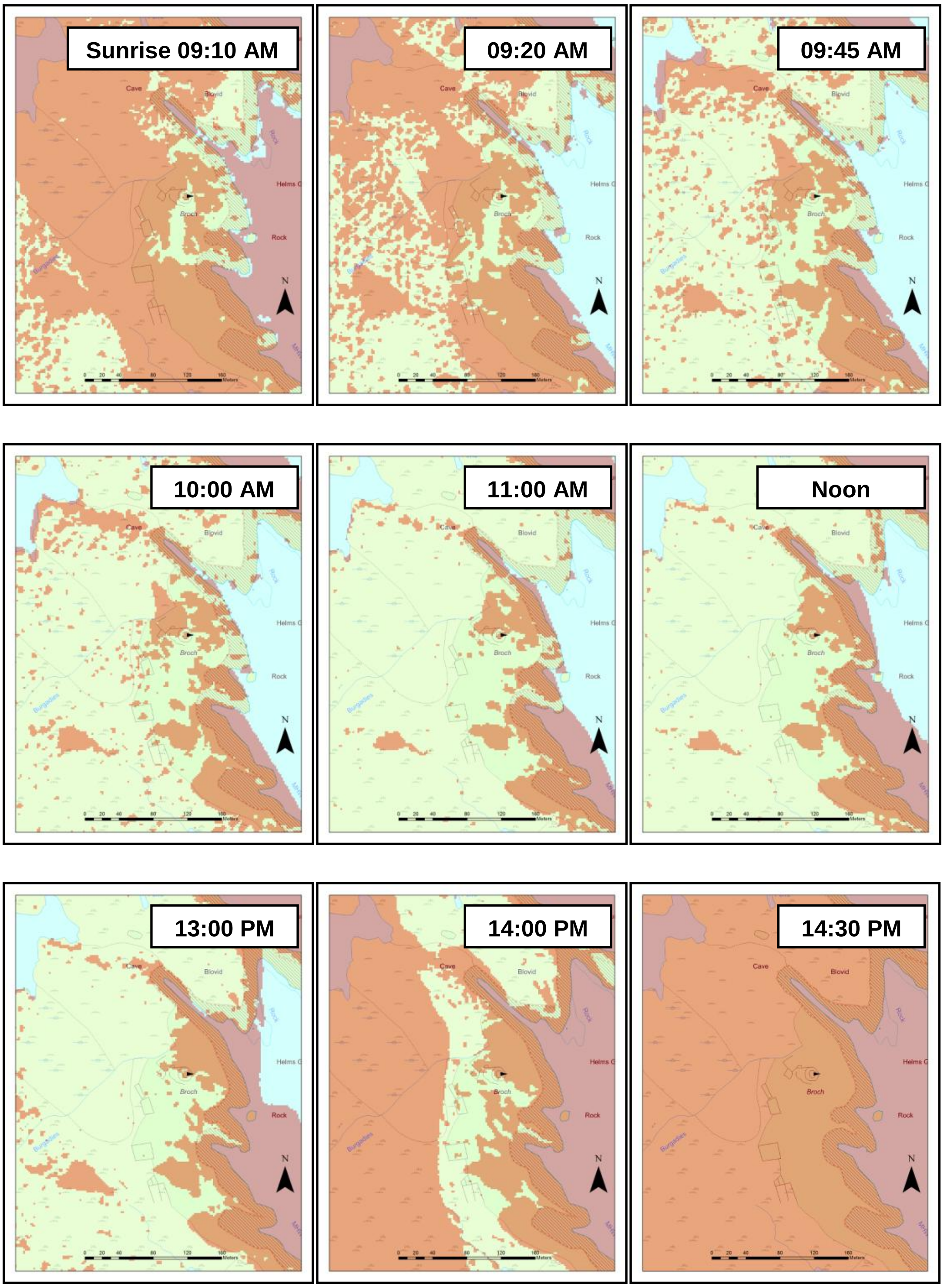


Figure 5.32. Sunset (14:55:45 PM) around Levenwick on the Winter Solstice (21st December). Red areas denote areas of shadow.

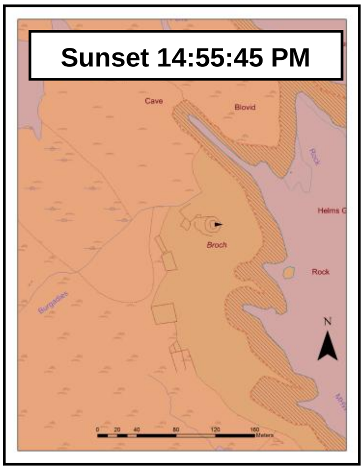


Figure 5.33. Sunrise (06:05:10 AM) to Noon around Levenwick on the Spring Equinox (21st December). Red areas denote areas of shadow.

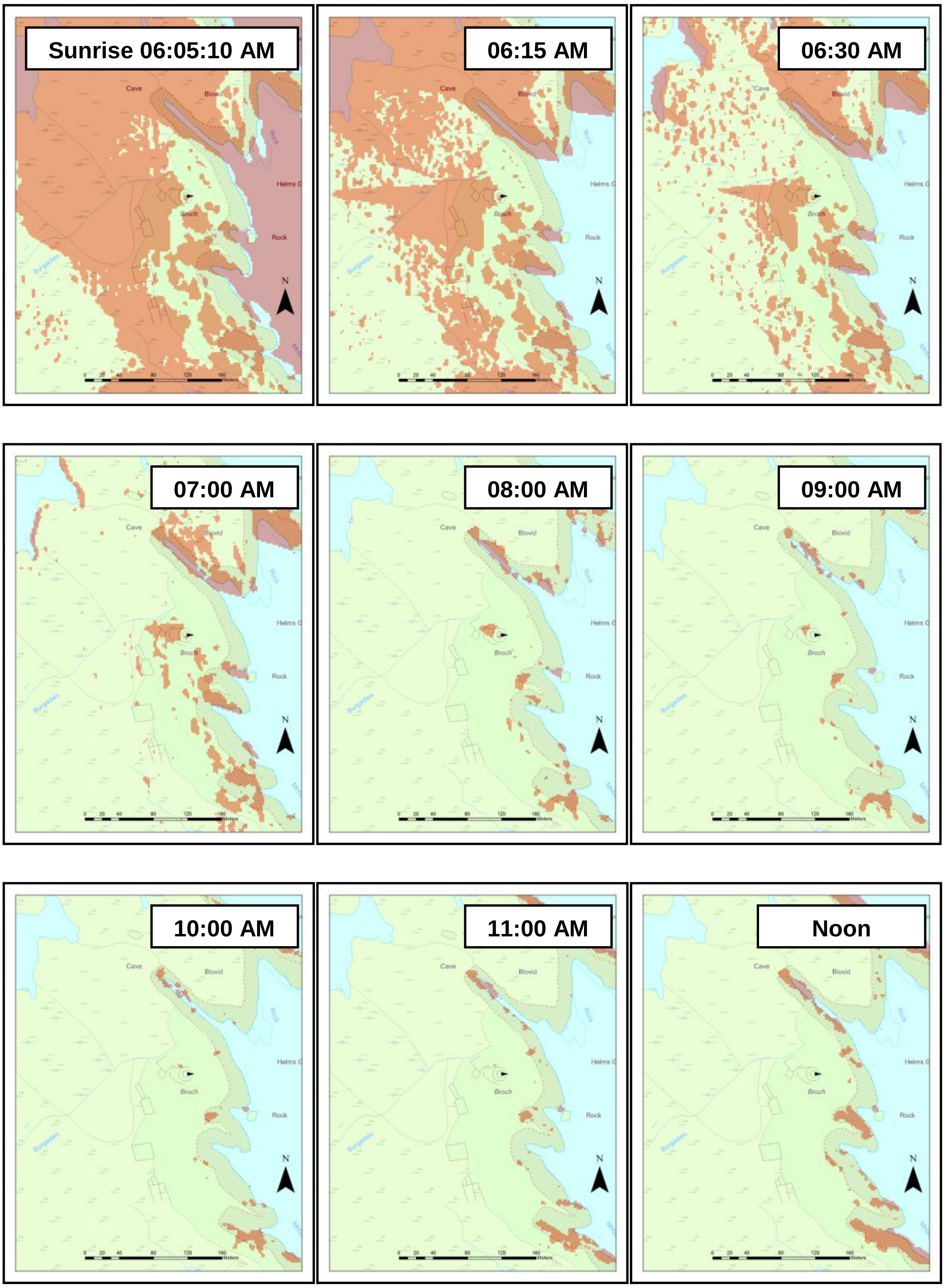


Figure 5.34. 13:00 PM to Sunset (18:10 PM) around Levenwick on the Spring Equinox (21st December). Red areas denote areas of shadow.

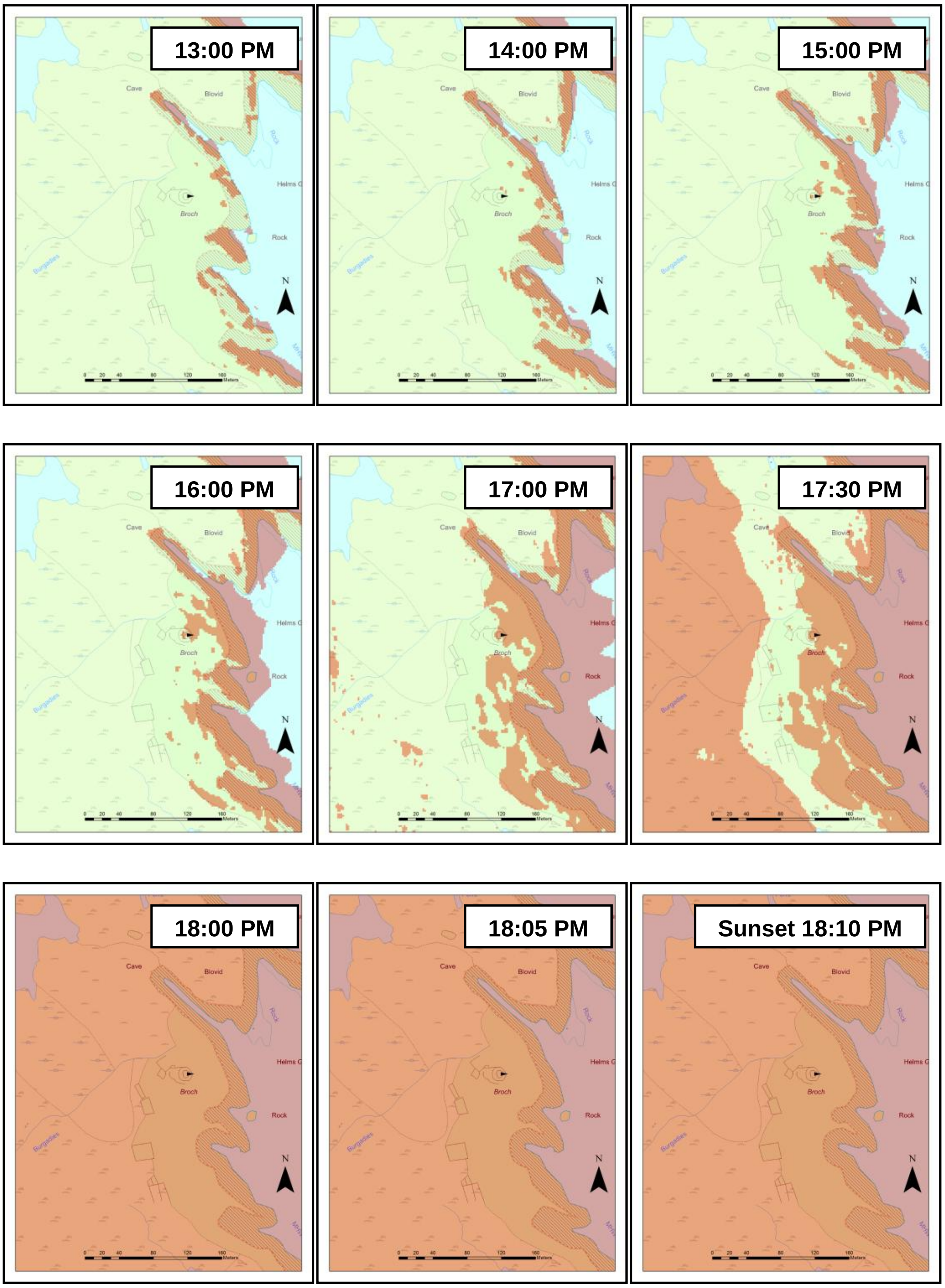


Figure 5.35. Sunrise (02:44:10 AM) to 10.00 AM around Levenwick on the Summer Solstice (21st June). Red areas denote areas of shadow.

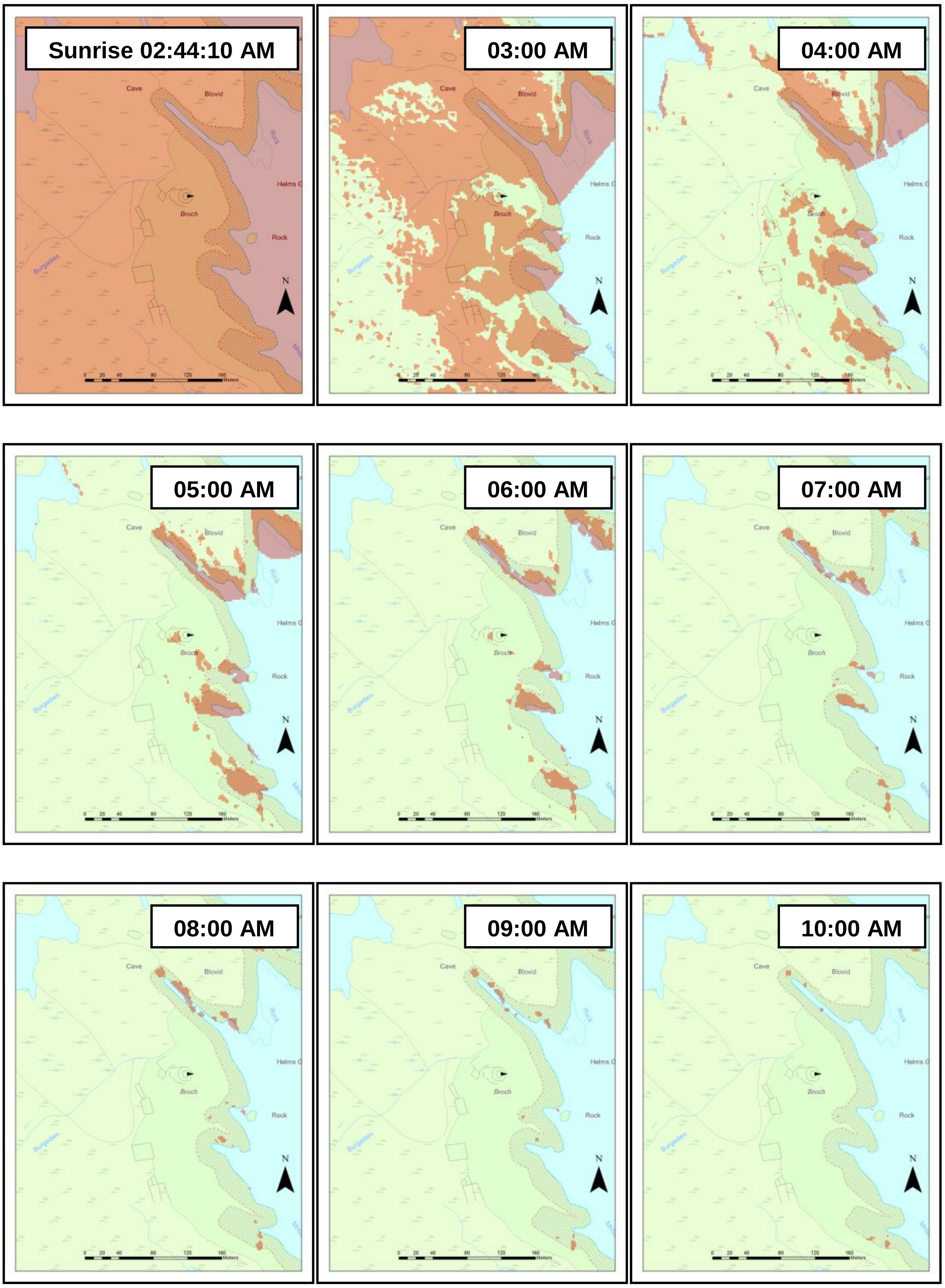


Figure 5.36. 11:00 AM to 19:00 PM around Levenwick on the Summer Solstice (21st June). Red areas denote areas of shadow.

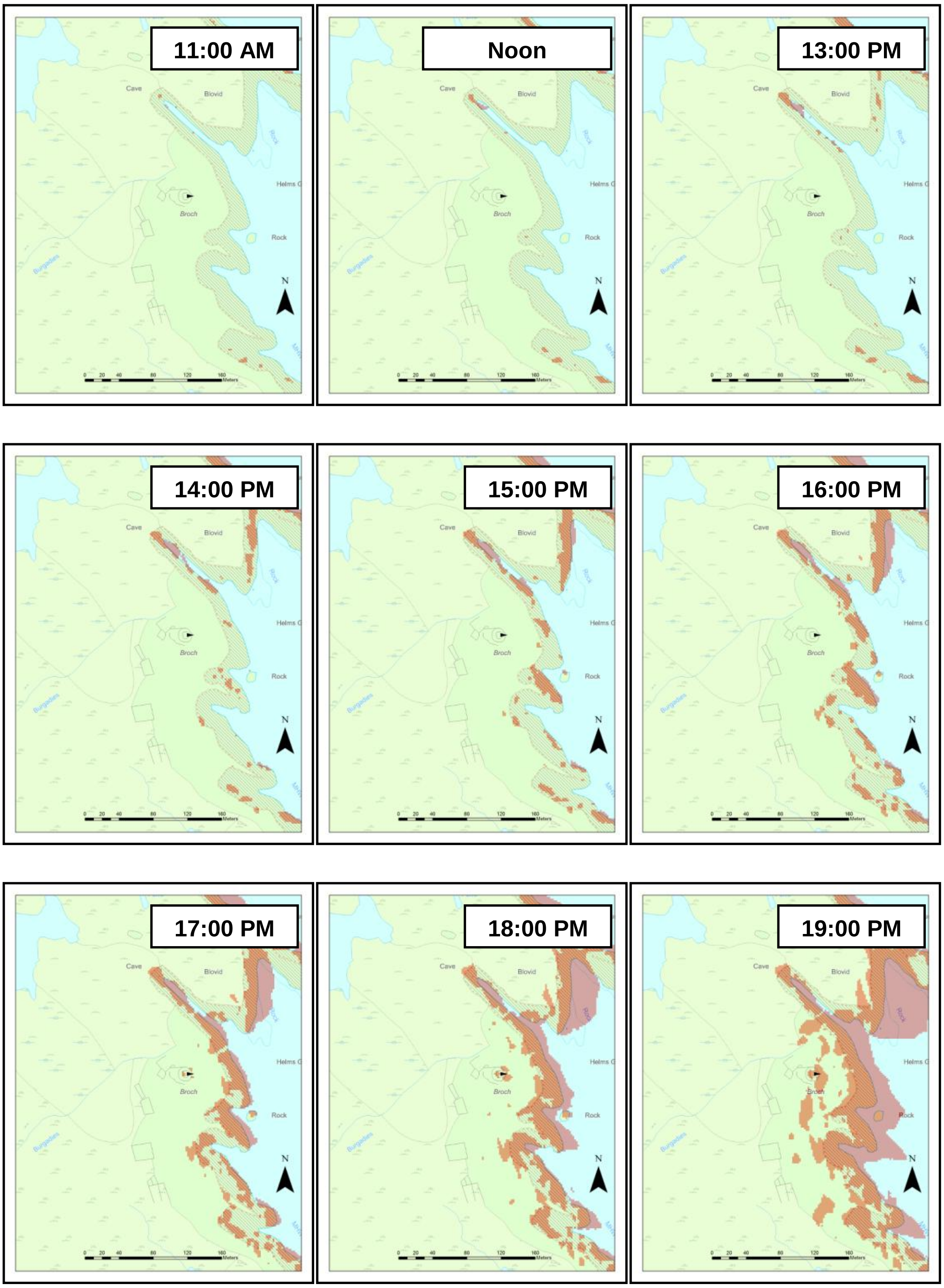
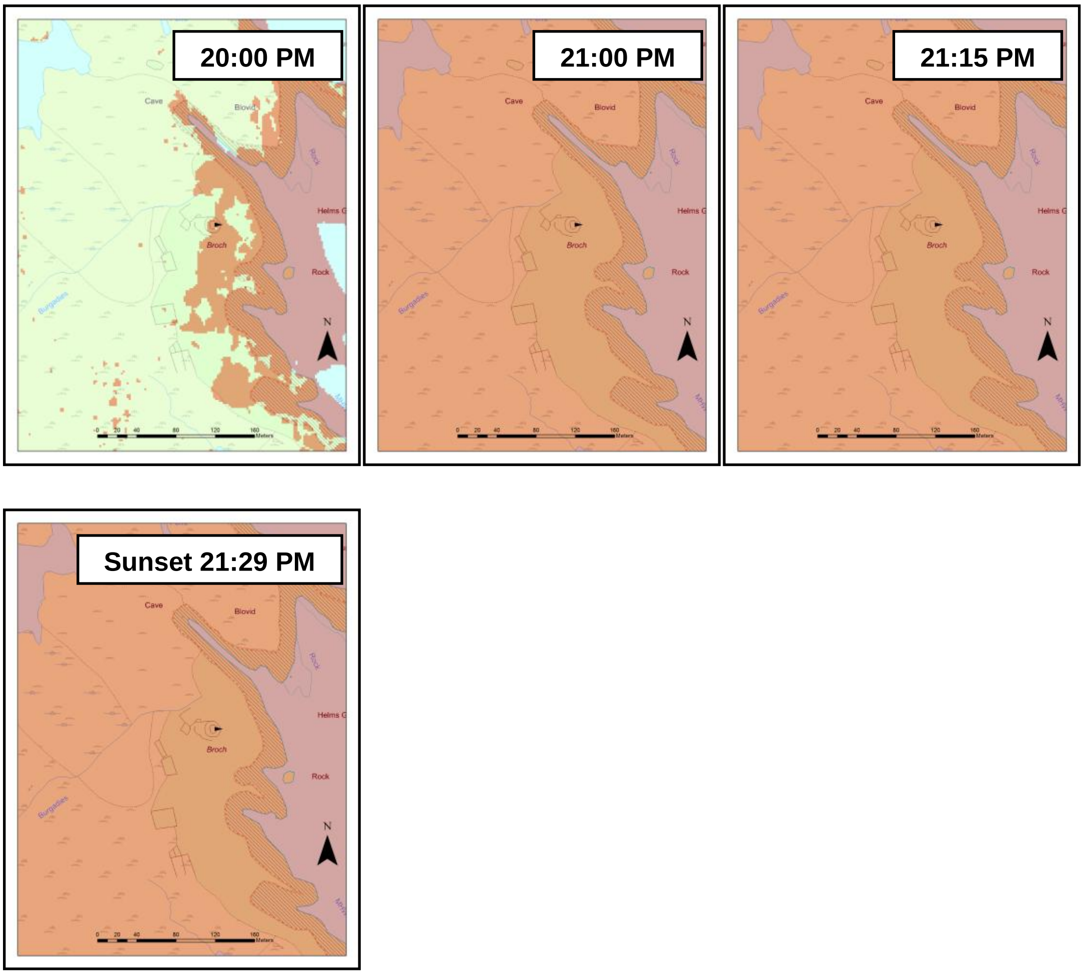


Figure 5.37. 20:00 PM to Sunset (21:29 PM) around Levenwick on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 4: Burga Water (2)

Canmore ID: 453

Entrance: E

The Broch and its Landscape Context

Like other island brochs on Shetland, this unexcavated, but largely exposed (see Spence 1899: 53) due-east facing broch (Figures 5.38 and 5.39) – or even thin-walled dun, as it has been described (RCAHMS 1946: 146) – does not have views of the sea (Figure 5.40), even though it is located less than a mile from the coast. With an apparent entrance on the east side, this broch has full views of its surrounding loch, but no views of other brochs. This suggests that the loch itself was the most important factor when selecting the site; overriding the usual importance of a view towards the sea. However, this fact (which is mirrored at Burga Water 1) also suggests that there may have been a link between water and the broch. Whether a broch had excellent views of the sea or whether it was positioned within a water body, the relationship between water and the structure seems to have been significant; an issue to be explored further in Chapter Six.

The Winter Solstice (21st December) – Figures 5.41 and 5.42

Unlike a few other island brochs on Shetland, this site gains comparatively good sunlight during the winter, receiving light about forty minutes after sunrise. However, due to its eastern entrance, it would probably not have gained too much direct light during the winter months anyway. Nevertheless, the site itself retains light for much of the day, until around 14:00 PM, when the islet falls into shade, nearly an hour before sunset. Though the eastern entrance is better suited to the winter than a western would have been, an entrance towards the SE or SSE would have been better for this site.

The Equinox (21st March) – Figures 5.43 and 5.44

The eastern entrance is most suited to both the spring and autumn, and indeed, the site receives light within the first hour after sunrise. The site and the loch that surrounds it then retains light throughout much of the day, with the eastern entrance receiving direct light during the early morning period especially. Sometime between 17:30 PM and 18:00 PM, the western side of the structure loses light, and within a few more minutes, most of the loch is in shadow. Nevertheless, a western entrance would have gained about the same amount of light as the eastern entrance does. The choice of an eastern entrance here may reflect a decision to avoid the westerly winds, though it may equally imply that the morning light was cherished within the broch structure itself.

The Summer Solstice (21st June) Figures 5.45, 5.46 and 5.47

Within an hour after sunrise, the site gains light, retaining it throughout the day; allowing the eastern entrance to be lit for much of the morning. This site is obviously well placed with regards to summer light, as it does not start to fall into the shade until around 21:00 PM, about half an hour before sunset.

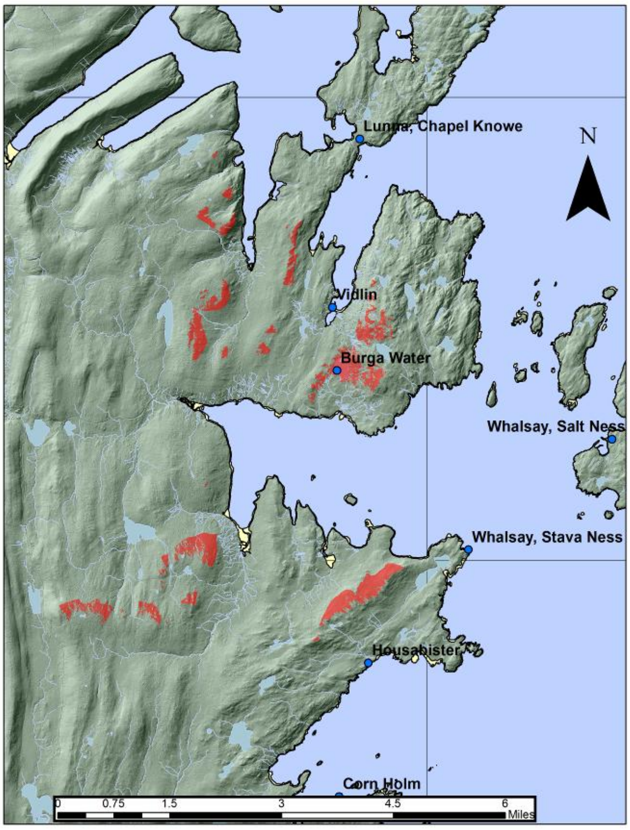
Conclusion

Unlike Burga Water (1) broch, it seems that this site does not lose such a large amount of light in the winter as to warrant a due S entrance. It may be that the builders here thought it appropriate to orientate for the remainder of the year, thereby forfeiting the winter light that could be garnered from the SE.

Figure 5.38. View towards Burga Water (2).
Author's Photo.

Figure 5.39. View towards Burga Water (2). Looking Eastwards.
Author's Photo.

Figure 5.40. Multiple Viewsheds of Burga Water (2) Broch.



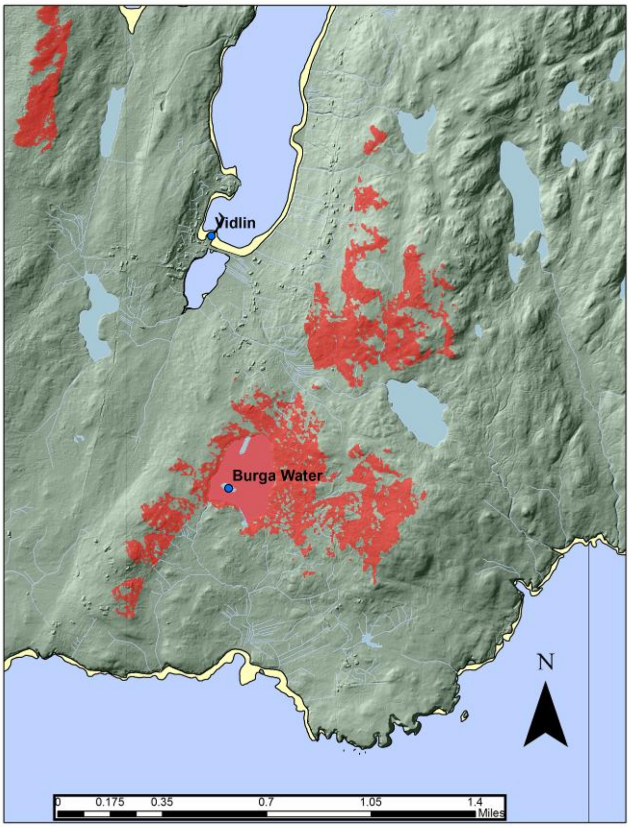


Figure 5.41. Sunrise (09:12:40 AM) to 14:00 PM around Burga Water (2) on the Winter Solstice (21st December). Red areas denote areas of

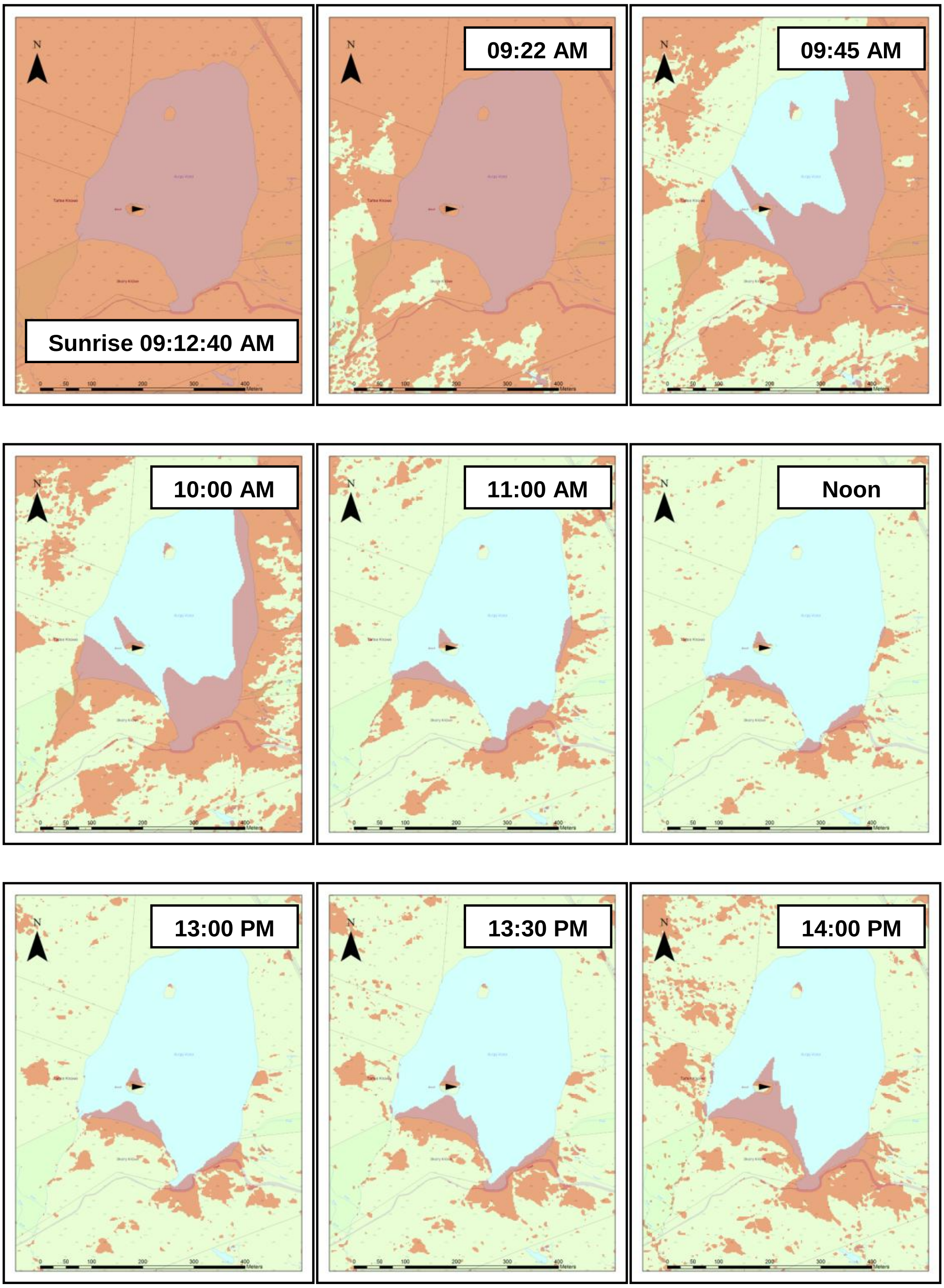


Figure 5.42. 14:00 PM to Sunset (14:53:10 PM) around Burga Water (2) on the Winter Solstice (21st December). Red areas denote areas of shadow.

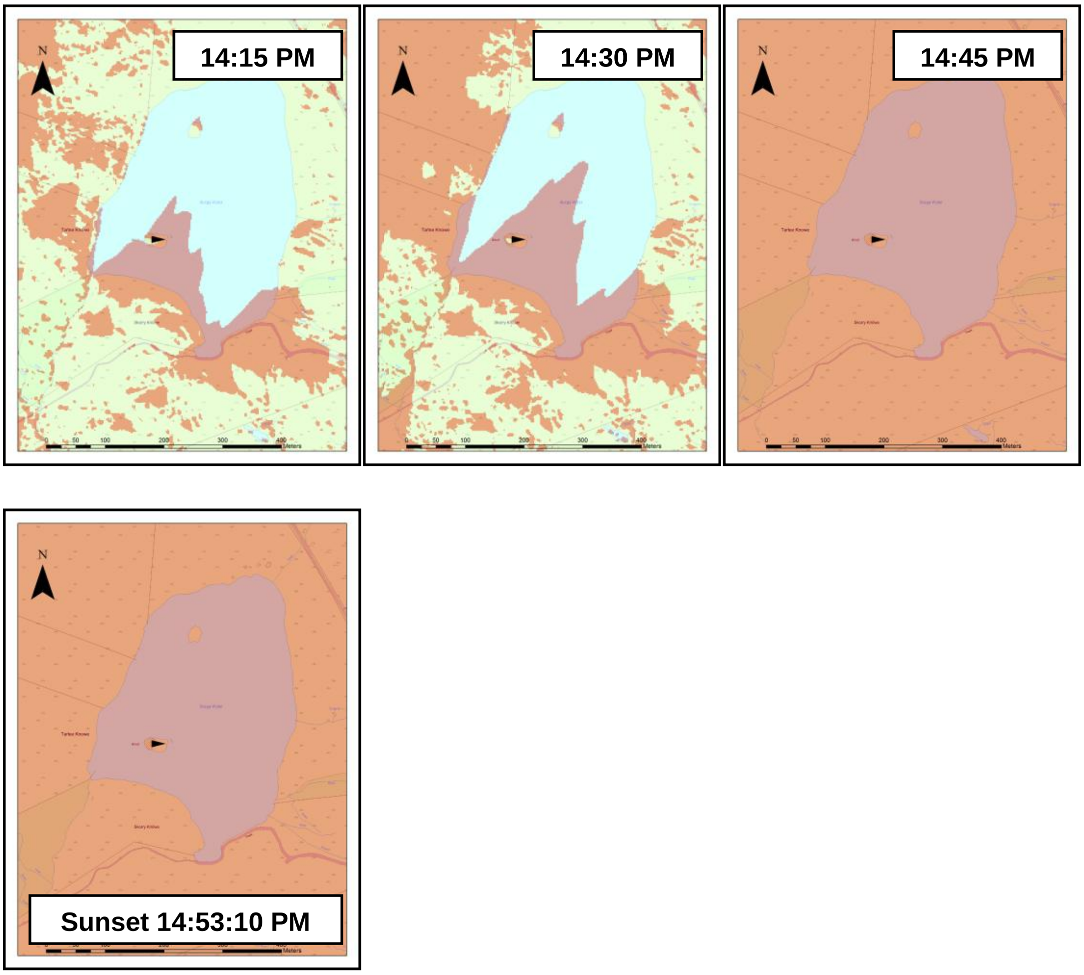


Figure 5.43. Sunrise (06:05:05 AM) to Noon around Burga Water (2) on the Spring Equinox (21st March). Red areas denote areas of shadow.

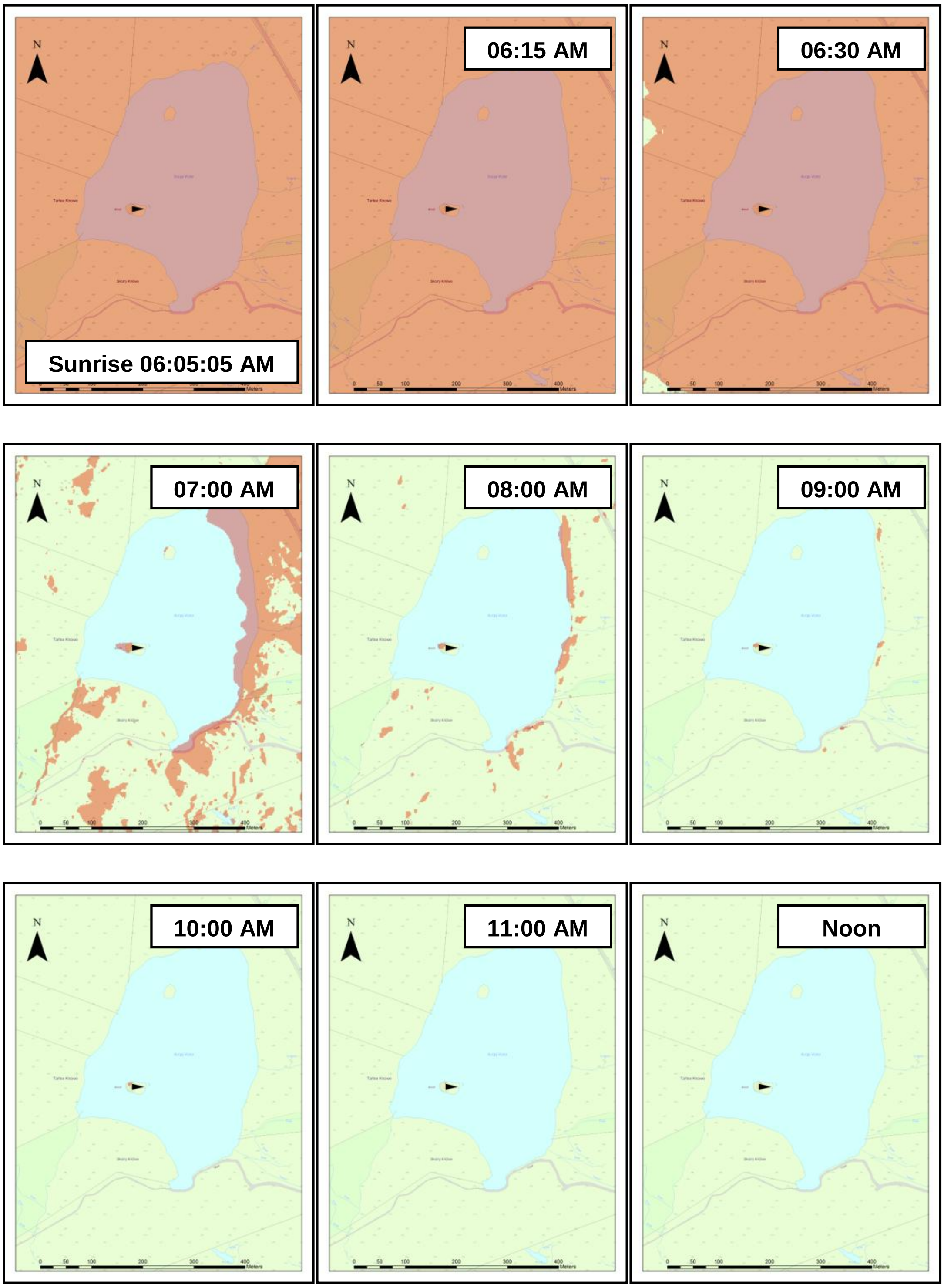


Figure 5.44.13:00 PM to Sunset (18:19 55 PM) around Burga Water (2) on the Spring Equinox (21st March). Red areas denote areas of shadow.

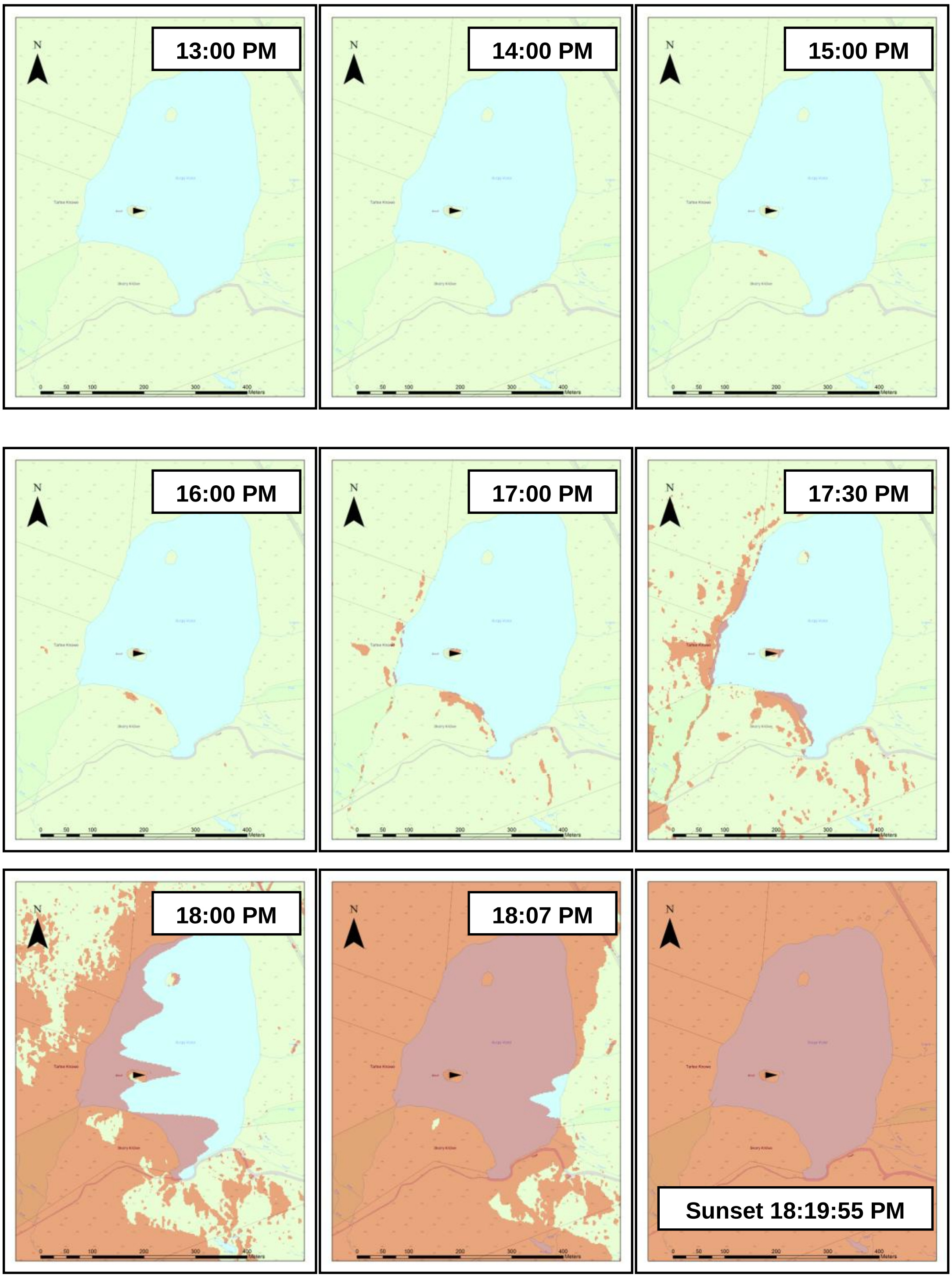


Figure 5.45. Sunrise (02:41:20 AM) to 09:00 AM around Burga Water (2) on the Summer Solstice (21st June). Red areas denote areas of shadow.

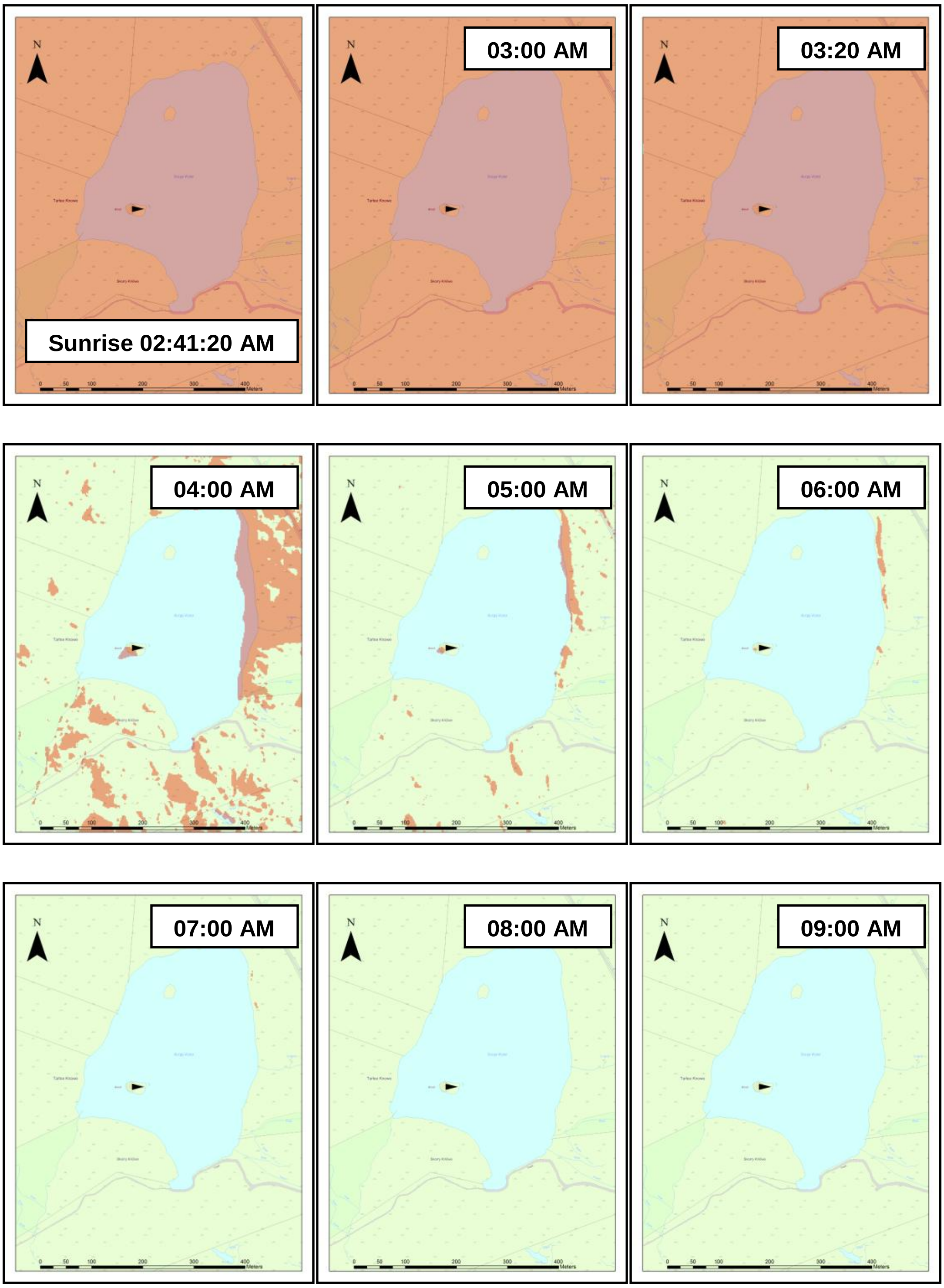


Figure 5.46. 10:00 AM to 18:00 PM around Burga Water (2) on the Summer Solstice (21st June). Red areas denote areas of shadow.

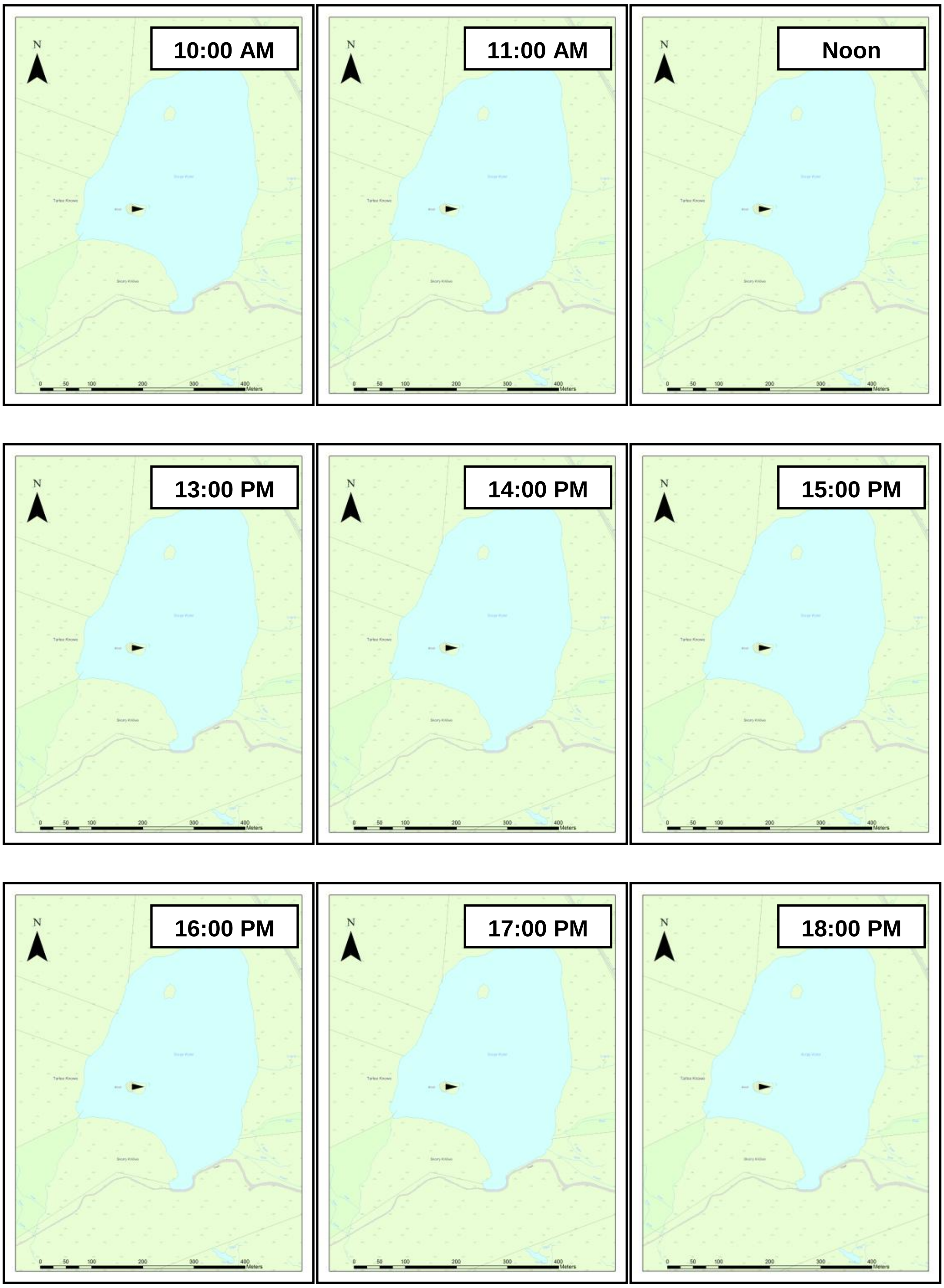
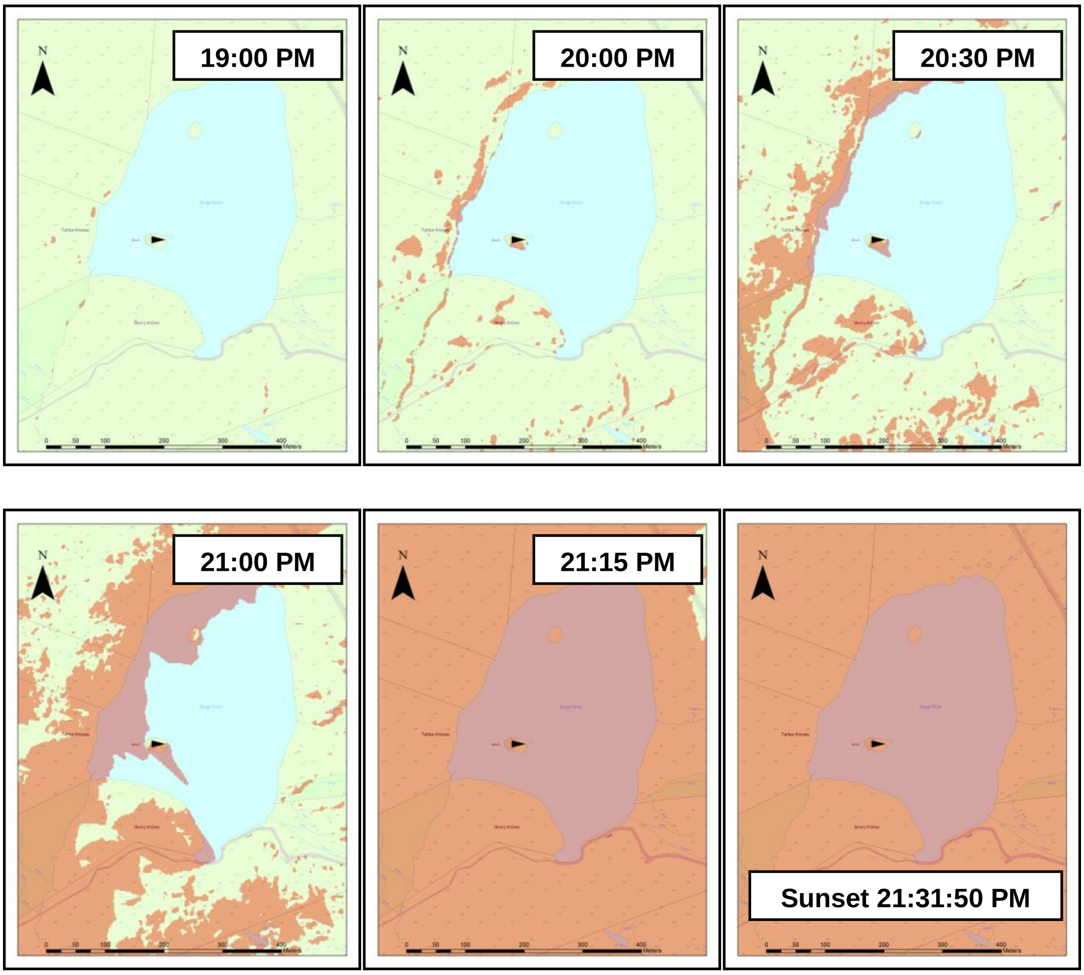


Figure 5.47. 19:00 PM to Sunset (21:31:50 PM) around Burga Water (2) on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 5: Fugla Ness

Canmore ID: 1224

Entrance: E

The Broch and its Landscape Context

Again, this unexcavated broch (see Figures 5.48 and 5.49) seems to have been positioned with the coast in mind. Though it lacks any view of the mainland to the west of the structure, it has views extending from the north, to the east, and to the south-east right along this stretch of eastern coastline (Figure 5.50). Though it has this far ranging view however, it has line-of-sight to only one other broch – Holm of Copister on Yell. Visibility of the seaways was thus of crucial concern for many of these structures. The entrance is not certain, but is believed to have been on the east side, where there are still traces of two oval-shaped cells within the thickness of the wall (RCAHMS 1946: 9), and these are likely to be a pair of 'guard-cells' flanking the main entrance. As a guide then, I will assume due E to be the entrance.

The Winter Solstice (21st December) – Figures 5.51 and 5.52

Within fifteen minutes of sunrise, the east side of the broch would have received sunlight. This remains so for the remainder of the morning, until noon. However, between noon and 13:00 PM, the site falls into shadow nearly two hours before sunset. Indeed, by 13:30 PM, the site is completely in the shade, as is the surrounding land. We can thus assume that a western entrance wasn't selected due to the lack of light coming from the west during winter. Indeed, an entrance towards due W or SW would have only received light for about an hour at most. The fact also that it doesn't face SE, which would have gained more light this time of year, suggests an avoidance of the SE winds coming of the sea here.

The Equinox (21st March) – Figures 5.53 and 5.54

This due E entrance is suited to both spring and autumn, and unlike many other brochs, Fugla Ness receives sunlight exactly at dawn. Within a matter of minutes, the landscape around the broch is also granted direct sunlight. The due E entrance would thus have gained direct light throughout the morning period then, and it is not until between 17:00 PM and 17:30 PM that the broch begins to falls into shadow, over an hour before sunset. Again, this means that the entrance in the east is apt for this broch's position in the landscape, receiving over an hour more light than a western entrance.

The Summer Solstice (21st June) Figures 5.55, 5.56 and 5.57

Gaining light within the first twenty-five minutes, both the broch and its surrounding landscape continue to receive light for much of the day, with the eastern entrance gaining light for the majority of the morning. By about 20:30 PM, the broch loses light and falls into the shade, again, over an hour before sunset. The eastern entrance is thus apt for this time of year also.

Conclusion

It is obvious that an eastern entrance would have been best for this site, which loses the afternoon (western) light in the winter, and the last hour of sunlight throughout the rest of the year. Though an entrance towards the SE would have been of greater benefit during the winter, the winds coming of the sea from the SE on this headland may have forced the builders to consider a due E entrance.

Figure 5.48. View towards Fugla Ness. Looking Eastwards over Yell. *Author's Photo.*

Figure 5.49. Ground Plan of Fugla Ness.
(After RCAHMS 1946)

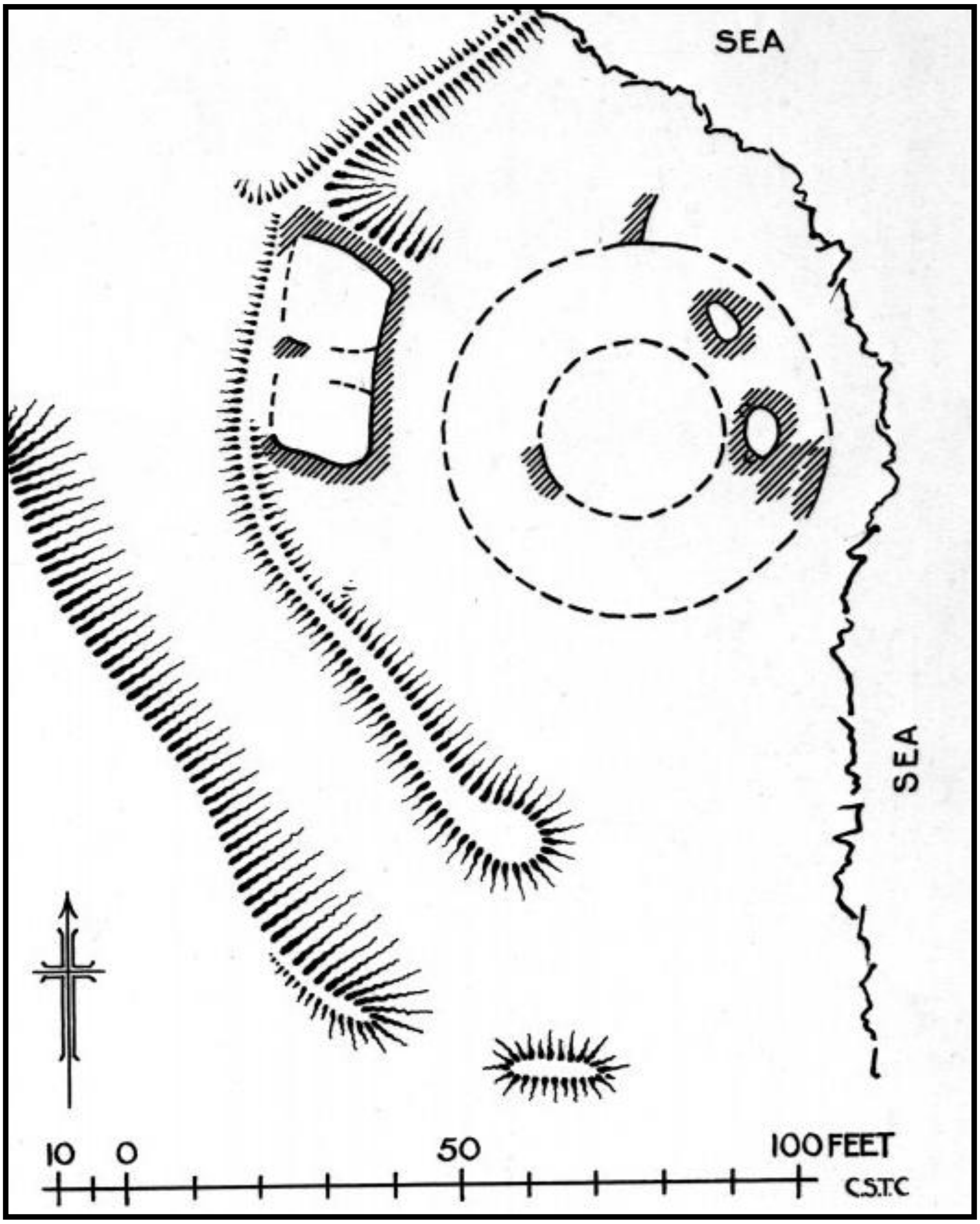


Figure 5.50. Multiple Viewsheds of Fugla Ness Broch.

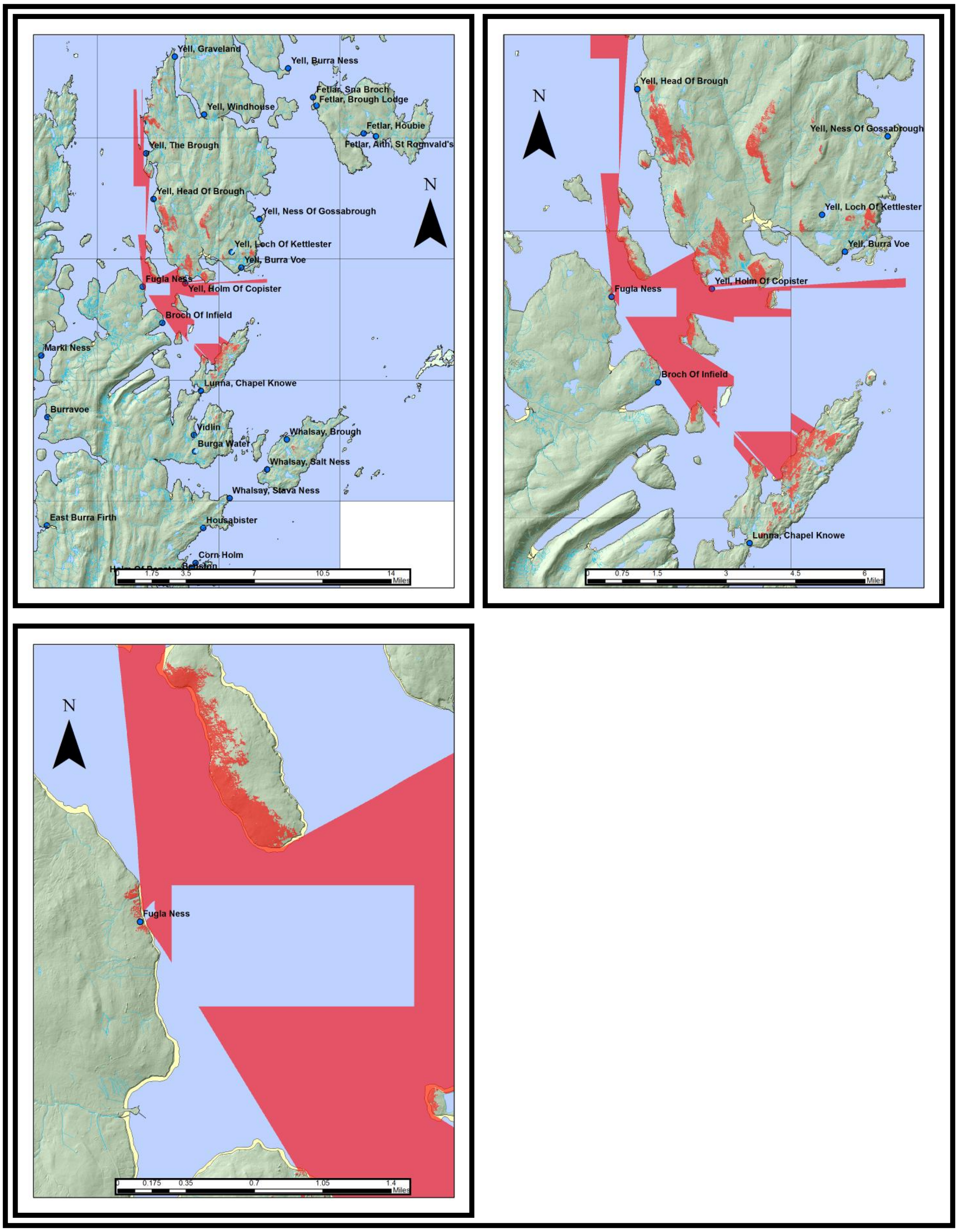


Figure 5.51. Sunrise (09:16 AM) to 14:00 PM around Fugla Ness on the Winter Solstice (21st December). Red areas denote areas of shadow.

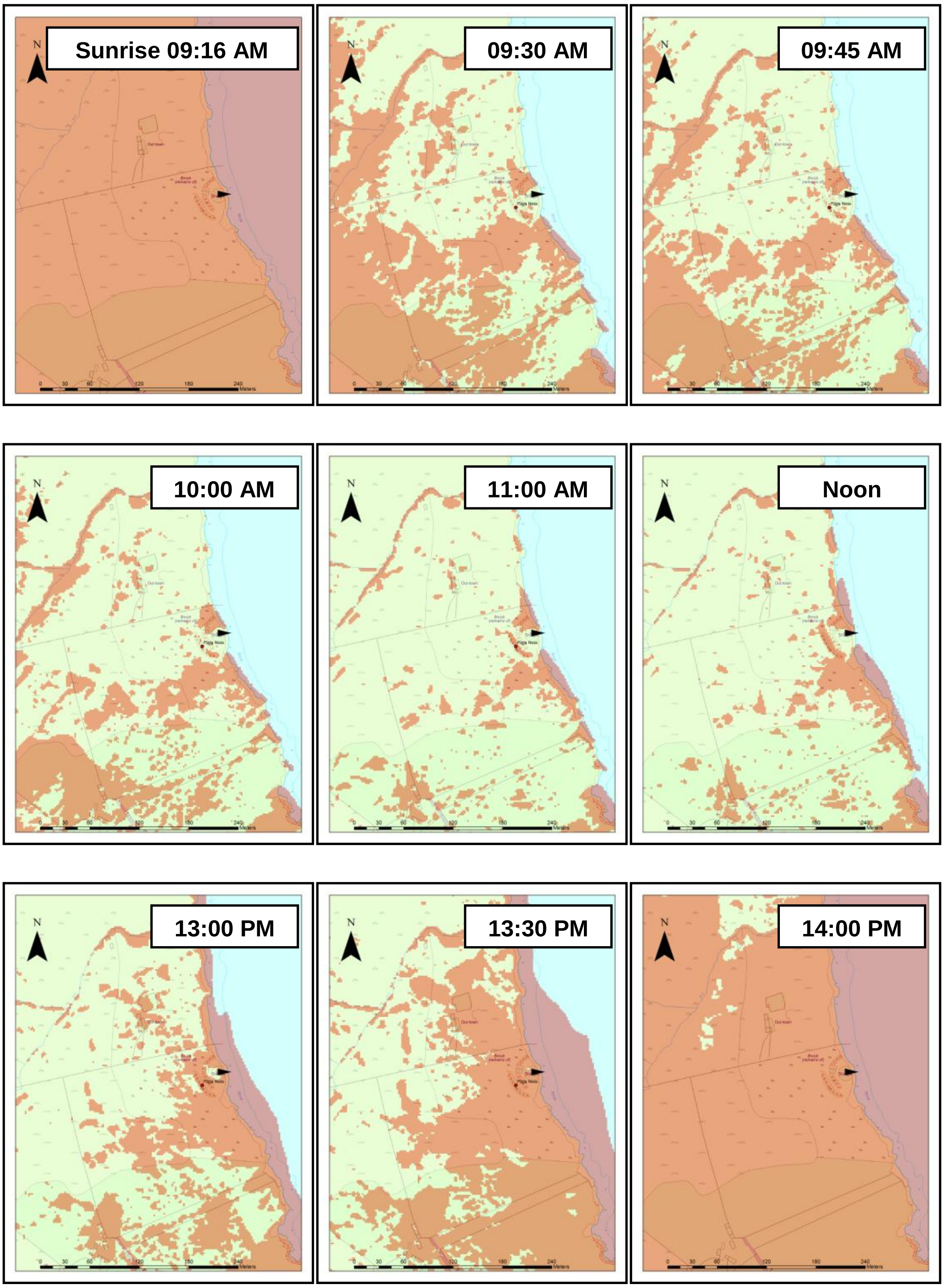


Figure 5.52. 14:15 PM to Sunset (14:49:50 PM) around Fugla Ness on the Winter Solstice (21st December). Red areas denote areas of shadow

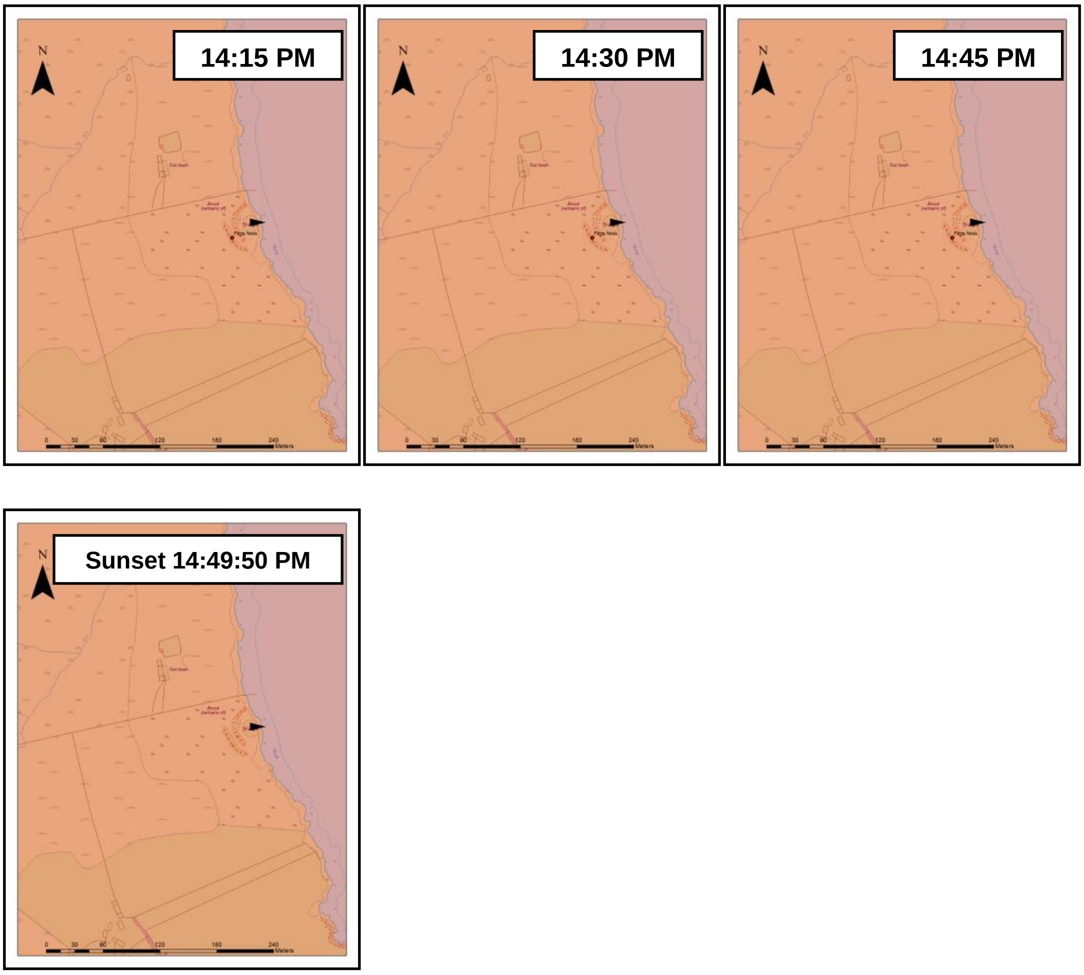


Figure 5.53. Sunrise (06:04:45 AM) to Noon around Fugla Ness on the Spring Equinox (21st March). Red areas denote areas of shadow.

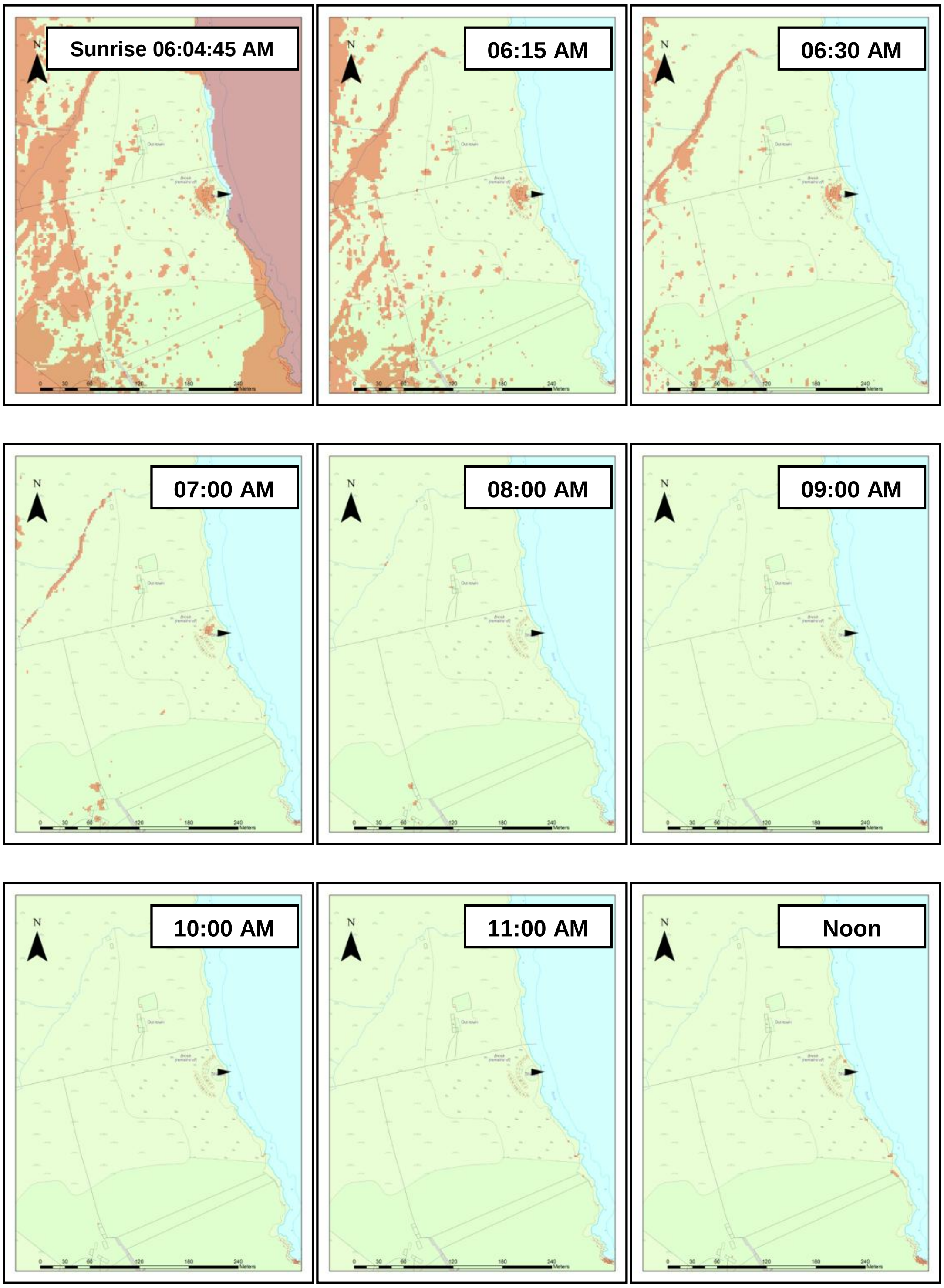


Figure 5.54. 13:00 PM to Sunset (18:19:45 PM) around Fugla Ness on the Spring Equinox (21st March). Red areas denote areas of shadow.

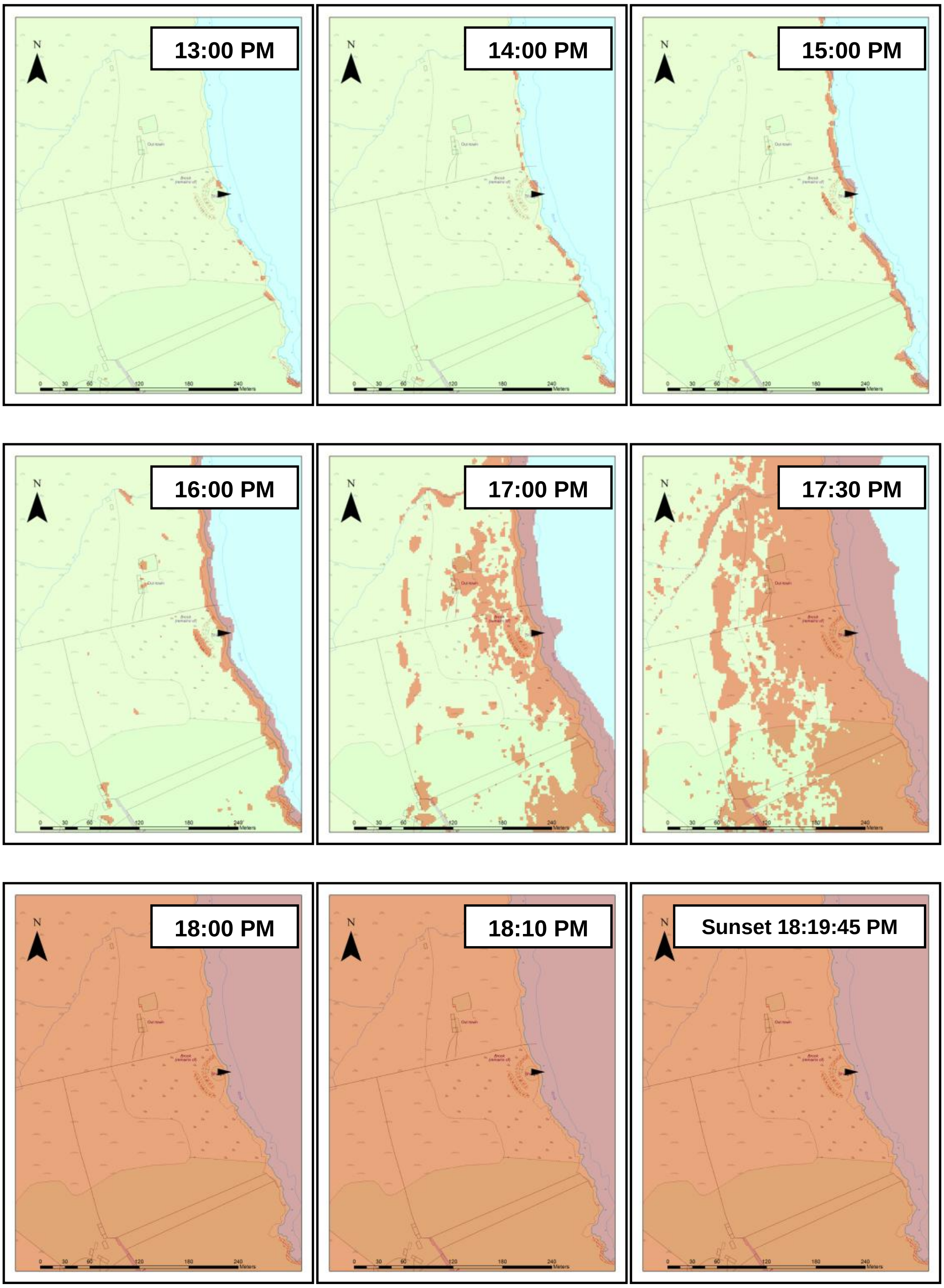


Figure 5.55. Sunrise (02:36:50 AM) to 08:00 AM around Fugla Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.

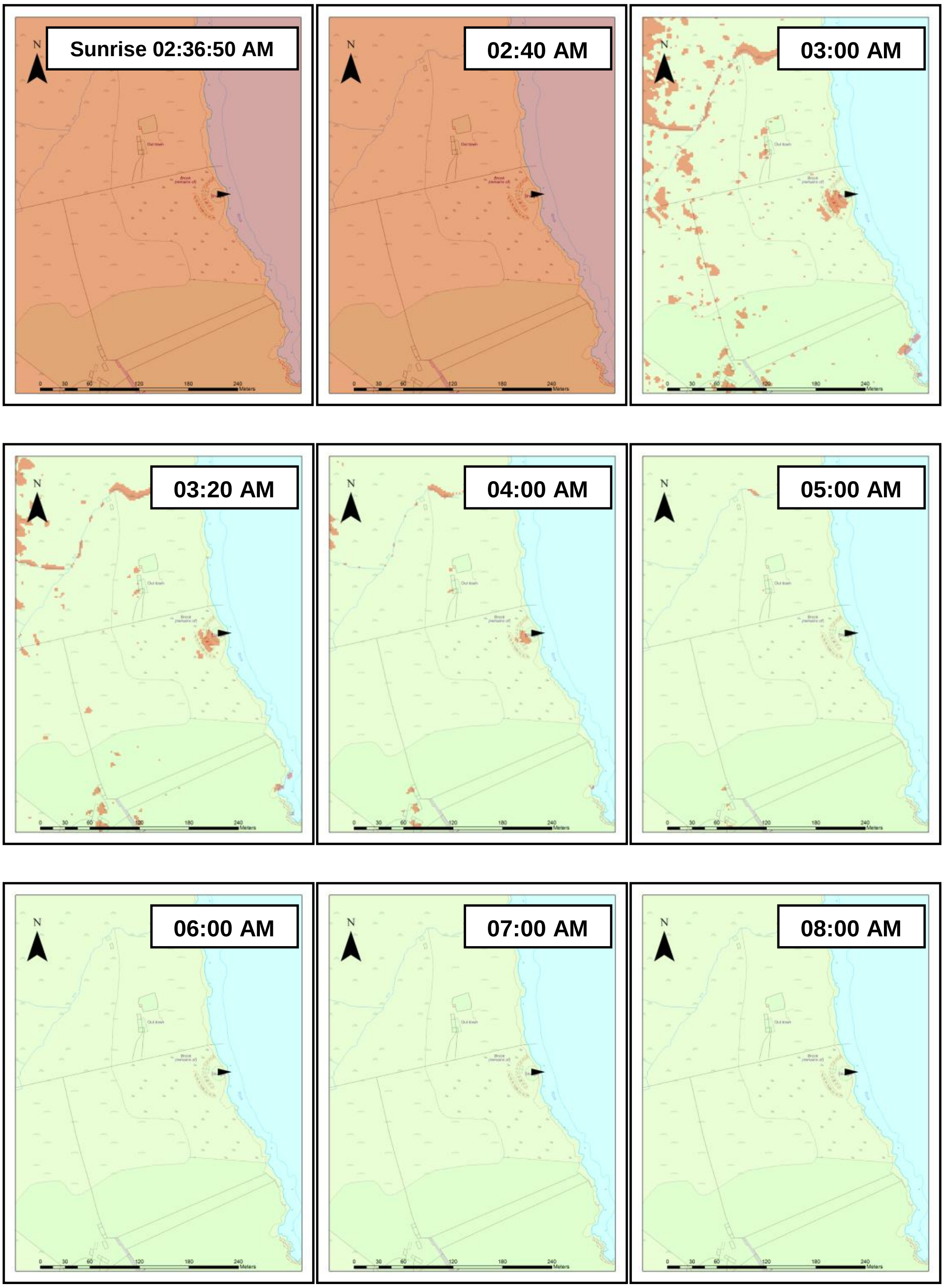


Figure 5.56. 10:00 AM to 17:00 PM around Fugla Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.

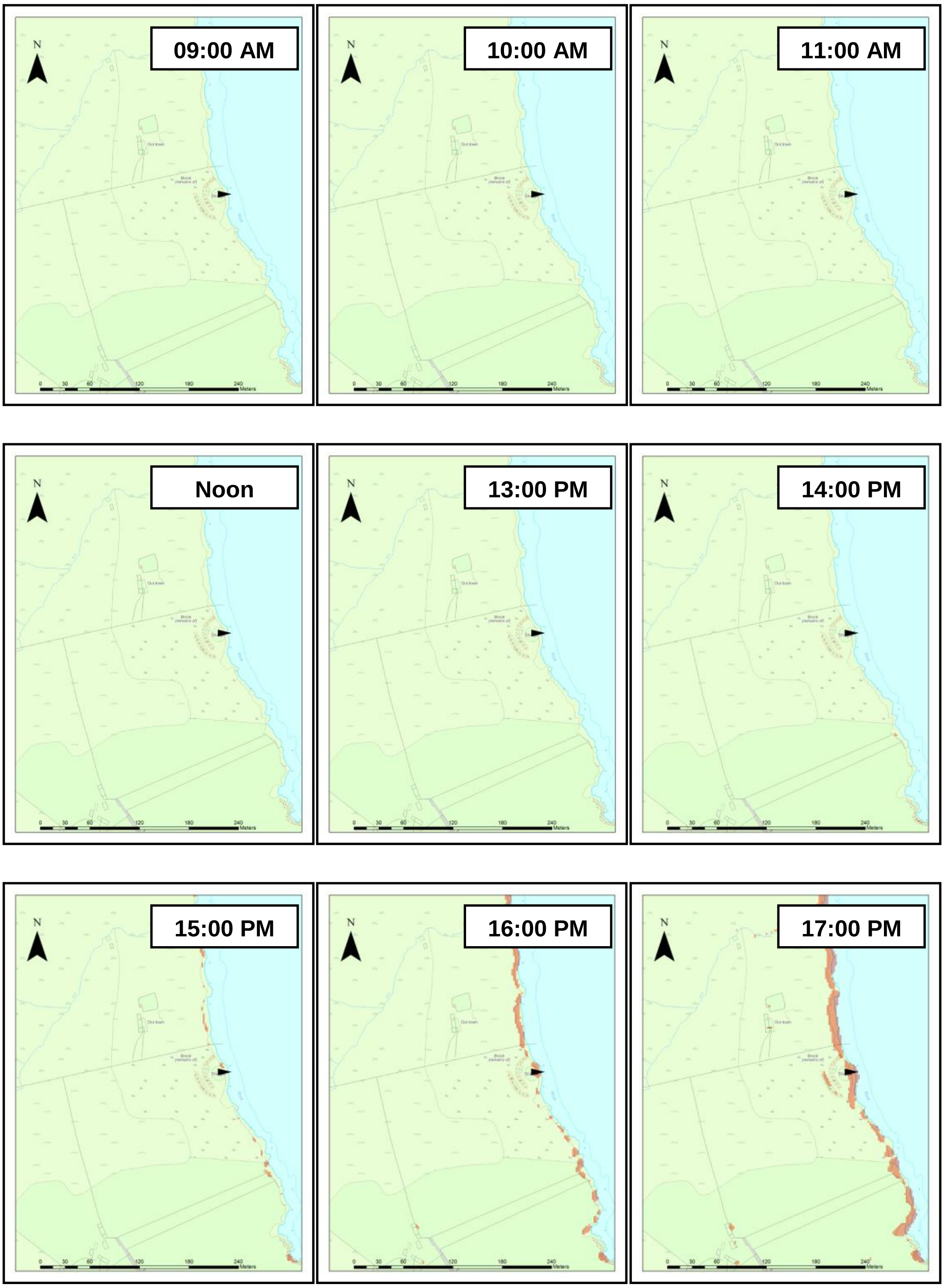
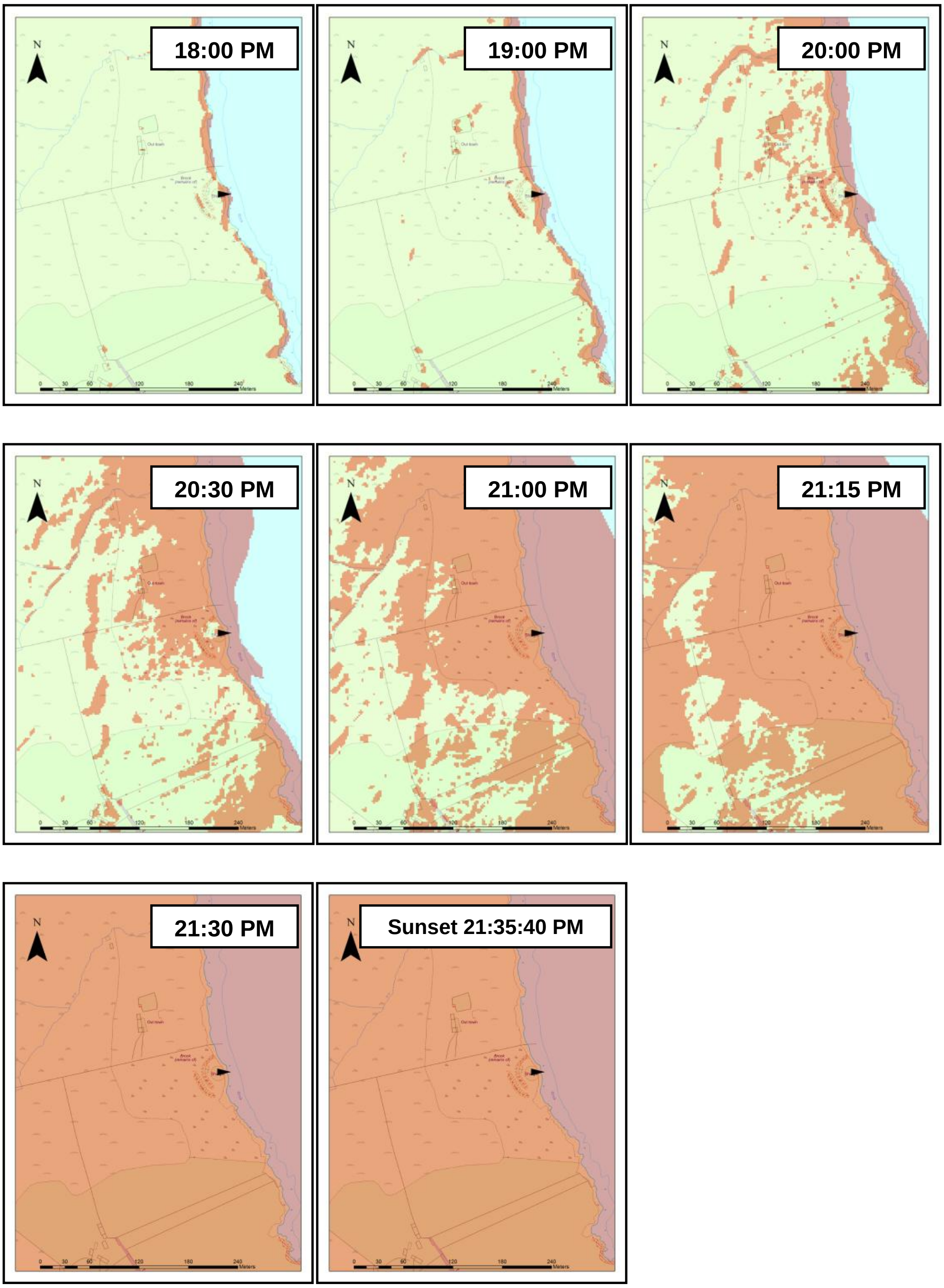


Figure 5.57. 18:00 PM to Sunset (21:35:40 PM) around Fugla Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 6: Sae Breck

Canmore ID: 495

Entrance: E

The Broch and its Landscape Context

Sae Breck (Figures 5.58, 5.59, 5.60, 5.61) is a partially excavated (Calder 1954; see Figure 62), probable solid-based broch located on the summit of a high but shallowly sloping hill next the sea. Indeed, this position was later taken advantage of as a watchtower which has been built exactly on top of the broch. As such, Figure 5.63 demonstrates how this broch not only has excellent views of the land immediately around the structure, but also of the north-west coastline of Shetland. And so, like many other brochs, a clear view of the sea seems to have been significant. However, it only has line-of-sight to one other broch, Muckle Bousta, far away to the south. However, like other brochs, it does overlook the nearest shore-accessible area and this factor seems to have been significant across Shetland. Its entrance is not certain however and is noted to be 'probably in the east' (RCAHMS 1946: 9), with Calder's (1954: 170) plan (Figure 5.62) also suggesting due east to be the entrance orientation. I will thus use due E as a guide only.

The Winter Solstice (21st December) – Figures 5.64 and 5.65

Due to its high position in the landscape atop a small hill, this site gains direct light throughout much of the day, and, throughout much of the year. Around the winter solstice, the eastern entrance would have gained direct light within the first fifteen minutes of the day. Throughout the remainder of the day, the broch receives direct sunlight, and it is, in fact, one of few brochs that actually receives sunlight until sunset itself during the winter solstice. Here then, a western entrance, especially an entrance towards the SW, would have gained a fraction more light than its eastern entrance seems to. An orientation towards the SE would have equally been beneficial during this period.

The Equinox (21st March) – Figures 5.66 and 5.67

The eastern entrance gains direct light within ten minutes of sunrise, retaining it for the morning. Its position on the hill means that the site and immediate vicinity receive light for the entirety of the day. Indeed, the sun sets on the broch's western wall, meaning that a western entrance would have received slightly more light, suggesting that the morning light may have been desired by the builders of this broch.

The Summer Solstice (21st June) Figures 5.68, 5.69, and 5.70

By 03:00 AM, twenty minutes after sunrise, the site and the landscape to the east of it gains direct light, and by 04:00 AM, much of the surrounding land is in light. The due E entrance would have gained sunlight around 06:00 AM, and remained in this light for much of the morning, until around 11:00 AM, or thereabouts. Again, the western side of the broch would have received a fraction more light than the east, with the broch's W and NW sides retaining direct sunlight until the sun sets.

Conclusion

Throughout the year, this site gains much more light than many of Shetland's other brochs; something which is primarily due to this broch's exposed position in the landscape. Throughout the year, the eastern entrance loses mere minutes of light in comparison to a potential western entrance. Nevertheless, this may simply have been a means of avoiding the westerly winds in this location, as it is very much open to the elements.

Figure 5.58. Remains of Sae Breck Broch.
Author's Photo.

Figure 5.59. Western View from Sae Breck.
Author's Photo.

Figure 5.60. Eastern View from Sae Breck.
Author's Photo.

Figure 5.61. Southern View from Sae Breck.
Author's Photo.

Figure 5.62. Plan of Sae Breck.
(After Calder 1954: 170; fig. 2).

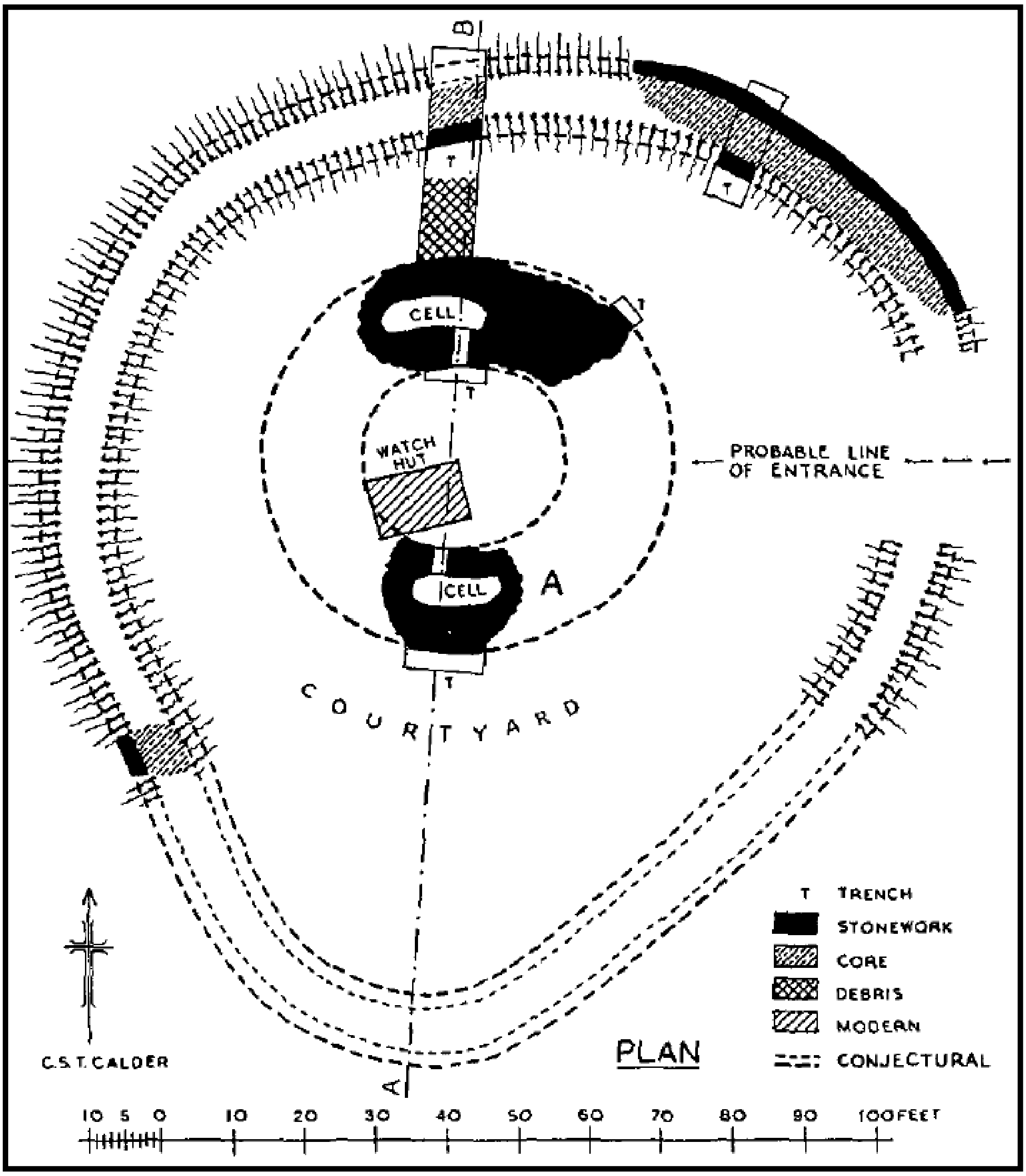


Figure 5.63. Multiple Viewsheds of Sae Breck Broch.

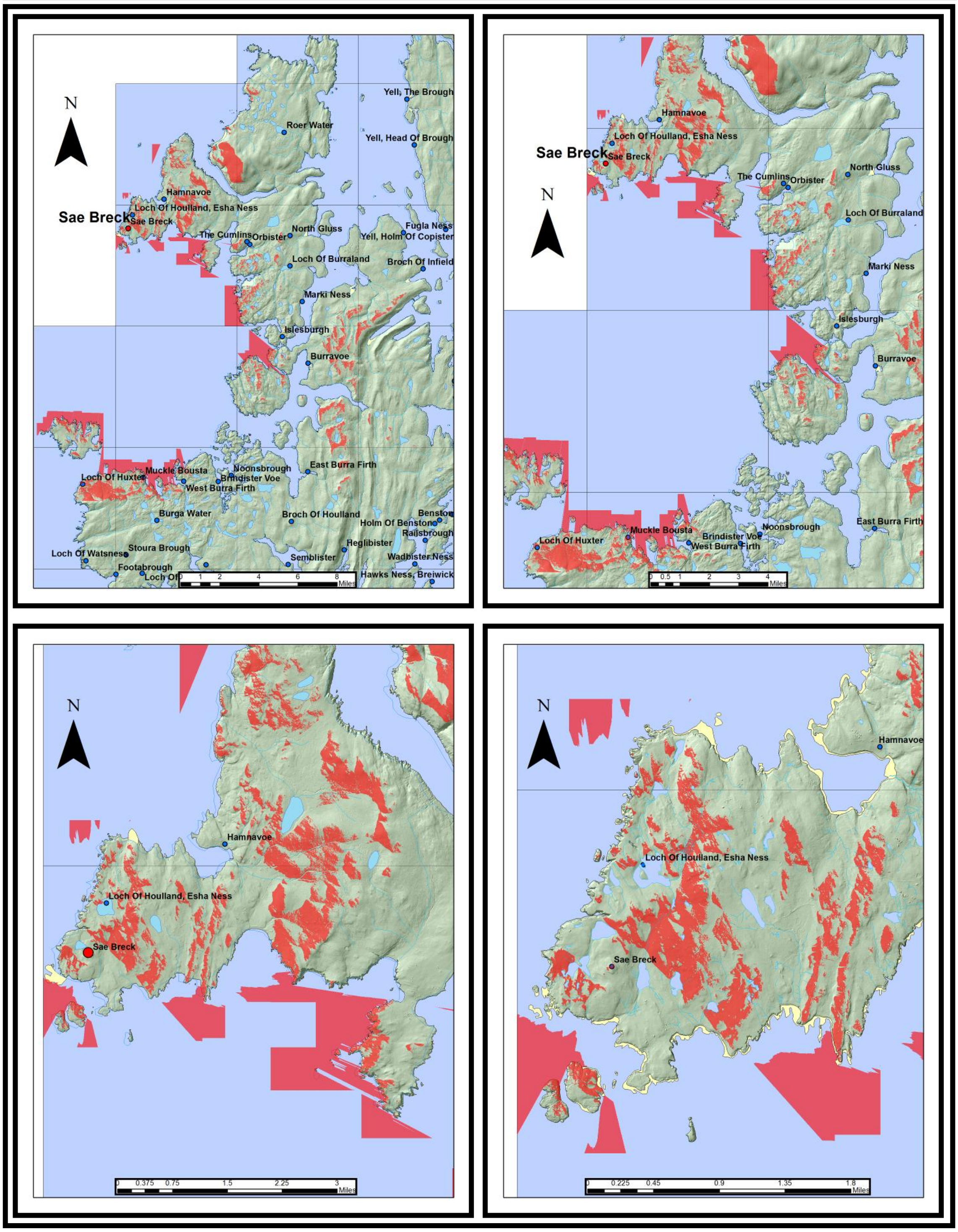


Figure 5.64. Sunrise (09:16 AM) to 14:00 PM around Sae Breck on the Winter Solstice (21st December). Red areas denote areas of shadow.

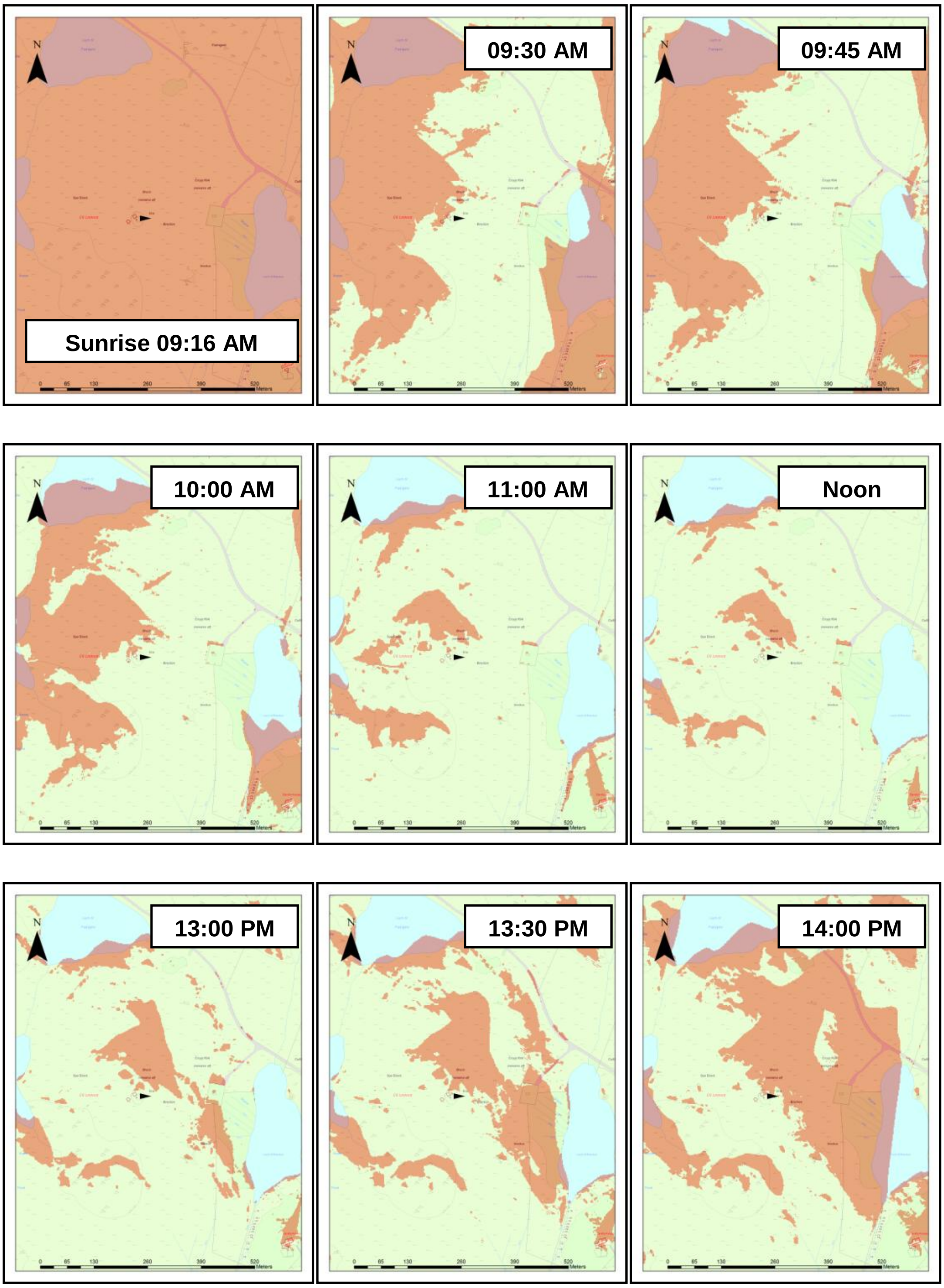


Figure 5.65. 14:15 PM to Sunset (14:49:50 PM) around Sae Breck on the Winter Solstice (21st December). Red areas denote areas of shadow.

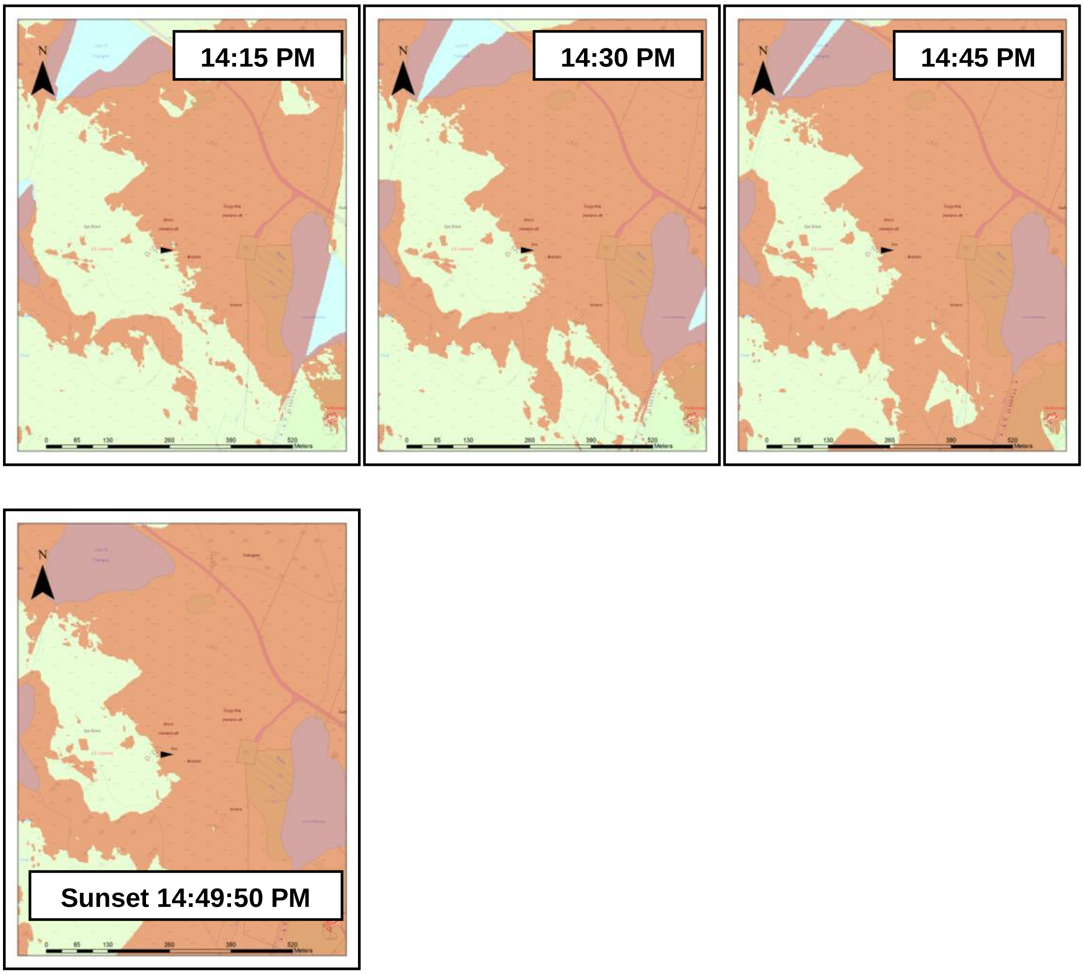


Figure 5.66. Sunrise (06:04:45 AM) to Noon around Sae Breck on the Spring Equinox (21st March). Red areas denote areas of shadow.

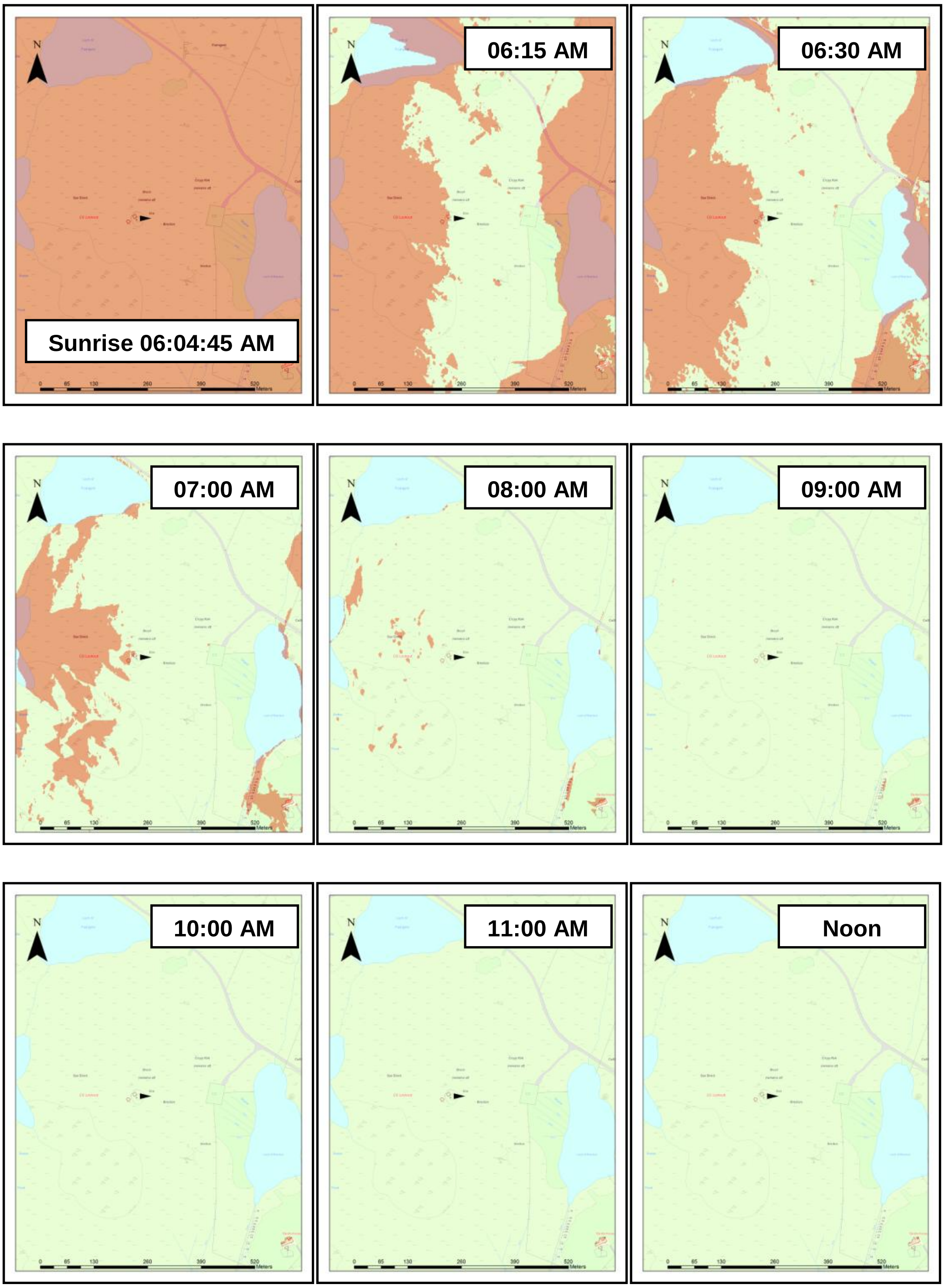


Figure 5.67. 13:00 PM to Sunset (18:19:45 PM) around Sae Breck on the Spring Equinox (21st March). Red areas denote areas of shadow.

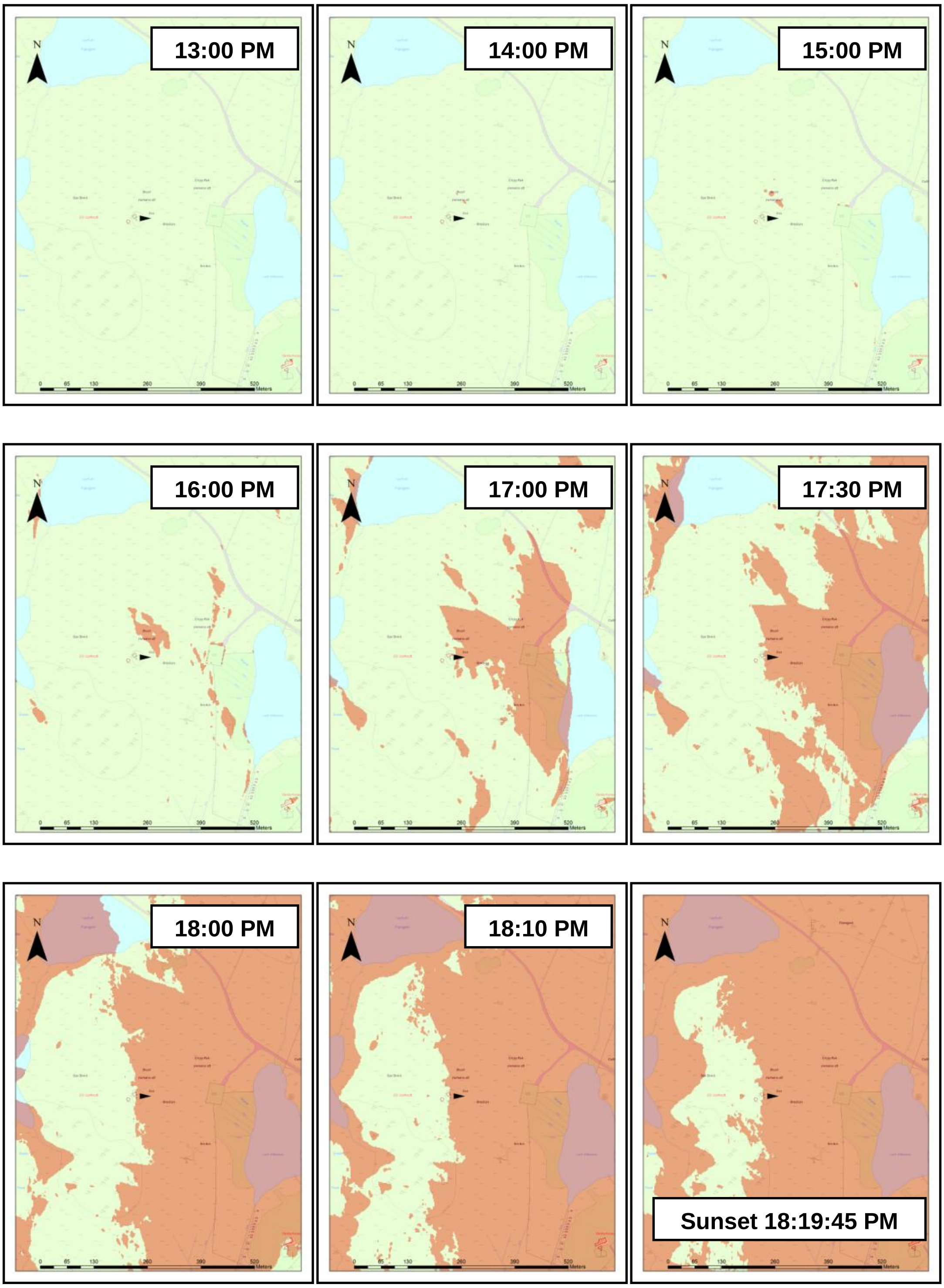


Figure 5.68. Sunrise (02:36:50 AM) to 08:00 AM around Sae Breck on the Summer Solstice (21st June). Red areas denote areas of shadow.

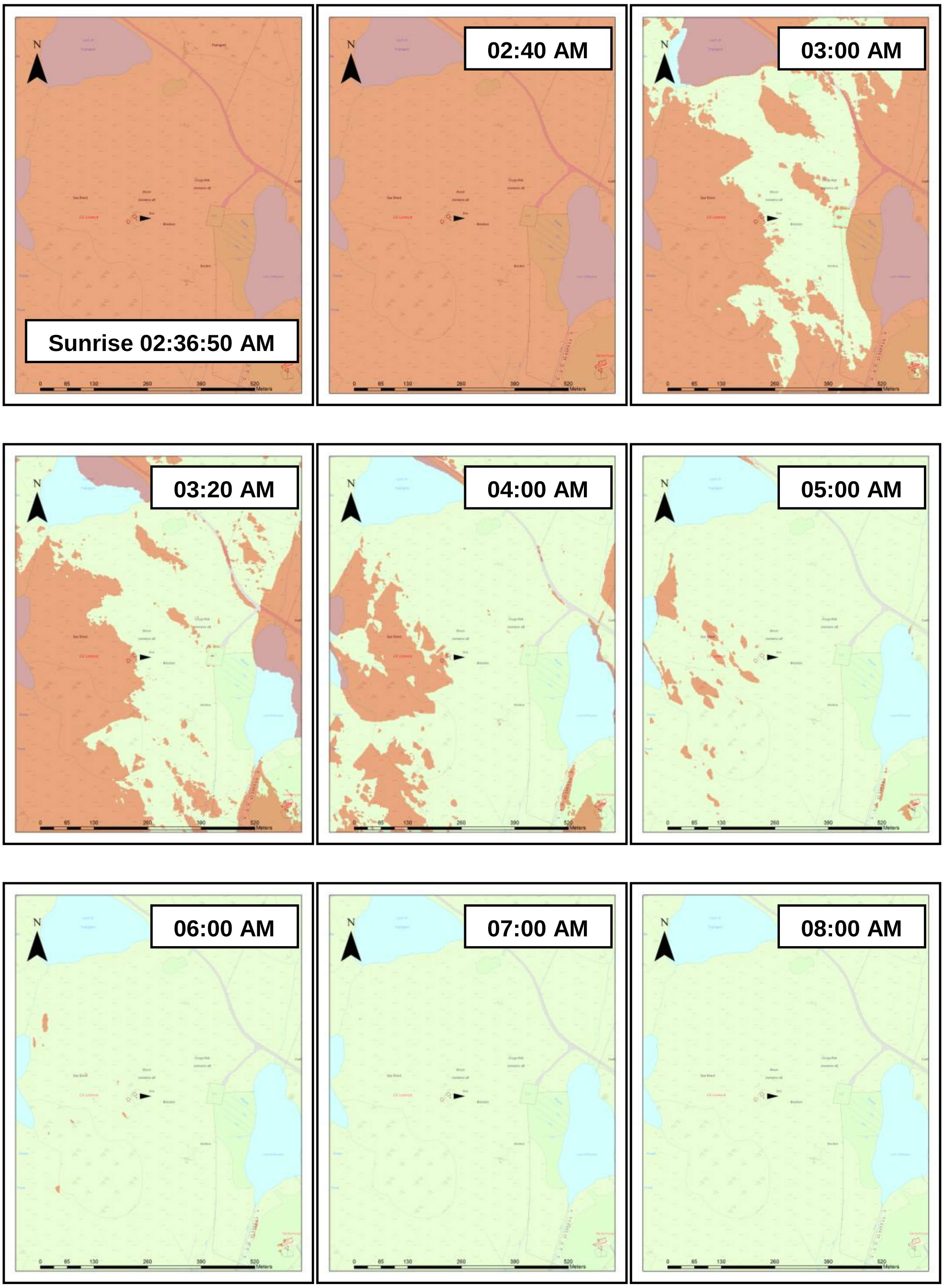
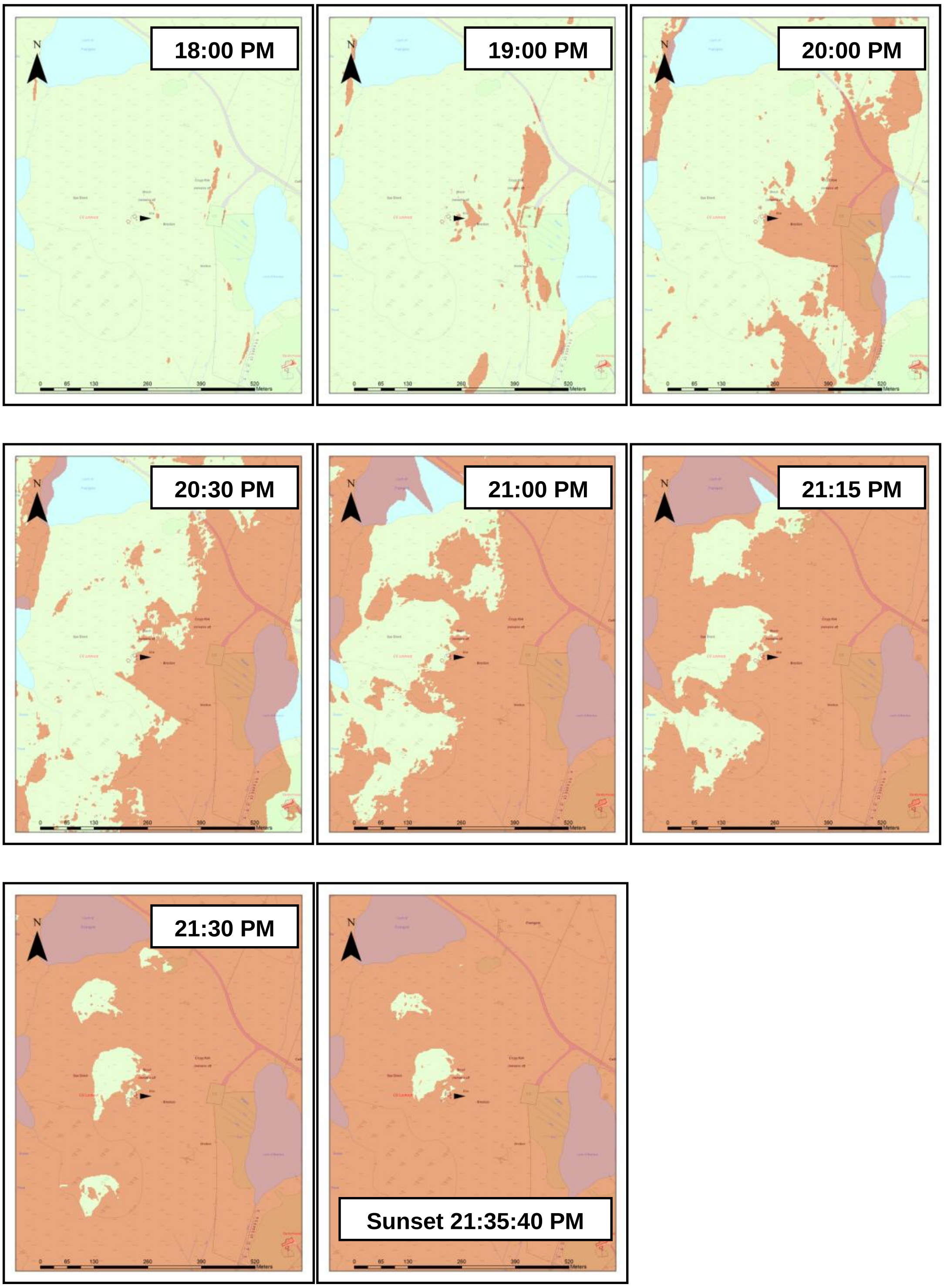


Figure 5.69. 09:00 AM to 17:00 PM around Sae Breck on the Summer Solstice (21st June). Red areas denote areas of shadow.

Figure 5.70. 18:00 PM to Sunset (21:35:40 PM) around Sae Breck on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 7: The Brough

Canmore ID: 1240

Entrance: E

The Broch and its Landscape Context

The maritime focus of Shetland's brochs is well demonstrated at the Brough, as this unexcavated broch is located on a small tidal islet which extends out from the island of Yell, and therefore possesses extensive views of Yell Sound (Figure 5.71). Furthermore, it has a commanding view of the potential harbour of West Sand Wick, just to the north of the site. Though this is somewhat reminiscent of brochs located along Rousay Sound in Orkney, despite the Brough's extensive views, it does not possess a line-of-sight towards any other broch in Shetland; though it does have good views of the northern Mainland, especially around North Voe. Still, the maritime focus is obvious.

The Winter Solstice (21st December) – Figures 5.72 and 5.73

During midwinter, the broch's eastern entrance (MacKie 2002a: 117) would have only gained light during the hour after daybreak, as the sun rises in the SE during this period. However, for the first forty-five minutes, the broch is in the shade, and it is not until 10:00 AM that it gains direct sunlight. The broch and its small islet retain light for the rest of the day, with the south-west and western side of the broch maintaining this until about ten minutes before sunset. A western entrance would have been better suited then, though it could be argued that the eastern entrance faces away from the prevailing winds. However, the western side of the broch is somewhat protected by the western hills on Northmavine, and so an entrance due W would still have been beneficial.

The Equinox (21st March) – Figures 5.74 and 5.75

The eastern side of the site would have gained sunlight about twenty-five minutes after sunrise. By 10:00 AM, the islet is in near complete sunlight, and retains it for the day. By 17:00 PM, the western half of the broch and the islet are the only areas in light lest in the immediate landscape, but the broch's western side still keeps the light until at least twenty minutes before sunset. Again, a western entrance would have been better.

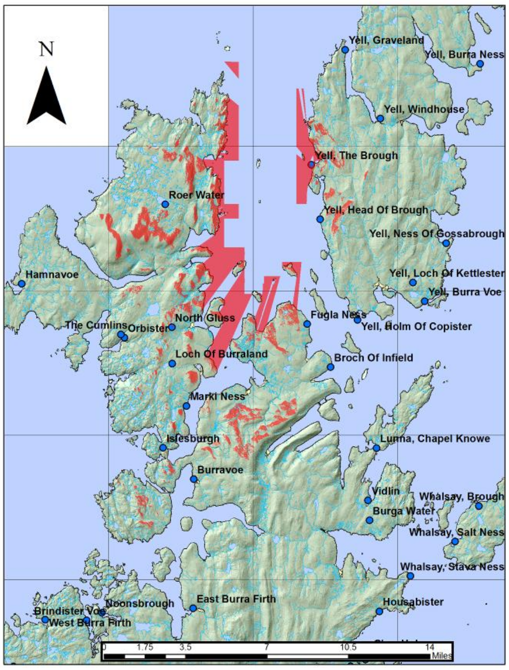
The Summer Solstice (21st June) Figures 5.76, 5.77 and 5.78

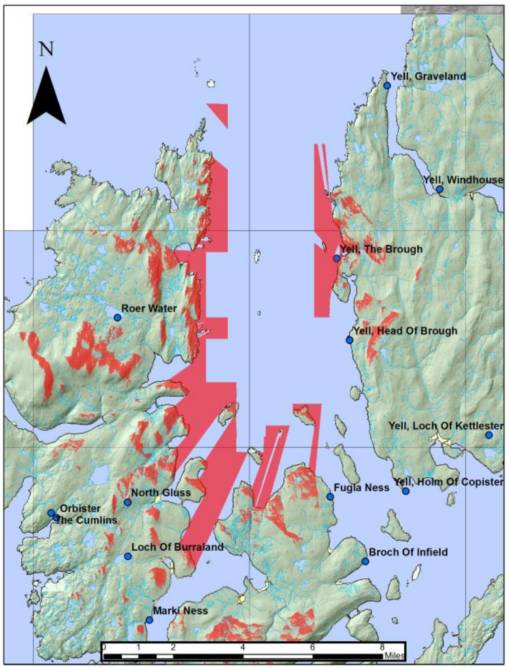
During the summer, the eastern side of the broch gains light about forty to forty-five minutes after sunrise, and the eastern entrance would have retained direct sunlight throughout much of the morning. The islet and the broch keep this for the day, and unlike other brochs on Shetland, this site retains sunlight right up until sunset itself, with the site's slight elevation allowing this to occur. For midsummer then, a western entrance would again have been more beneficial.

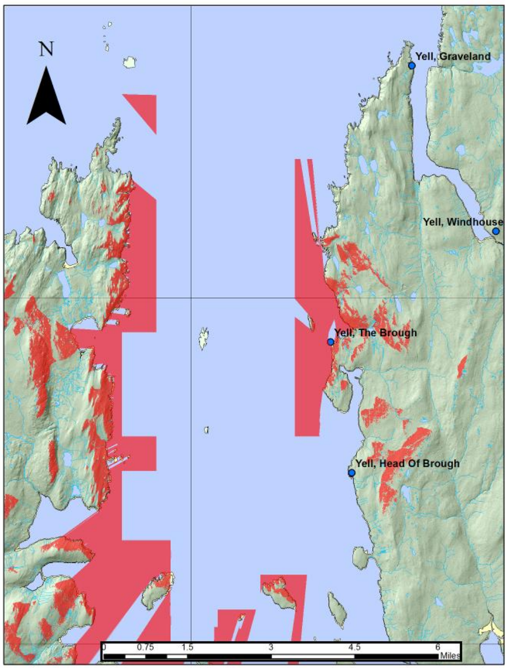
Conclusion

Throughout the year, this broch's western side gains more sunlight than its eastern. The choice of the eastern entrance is probably not due to a decision to avoid prevailing winds, but may simply have been a means of providing better access to the shore which lies to the east of the broch. Nevertheless, with regards to light, an entrance towards the W/SW would have been a better choice.

Figure 5.71. Multiple Viewsheds of The Brough Broch.







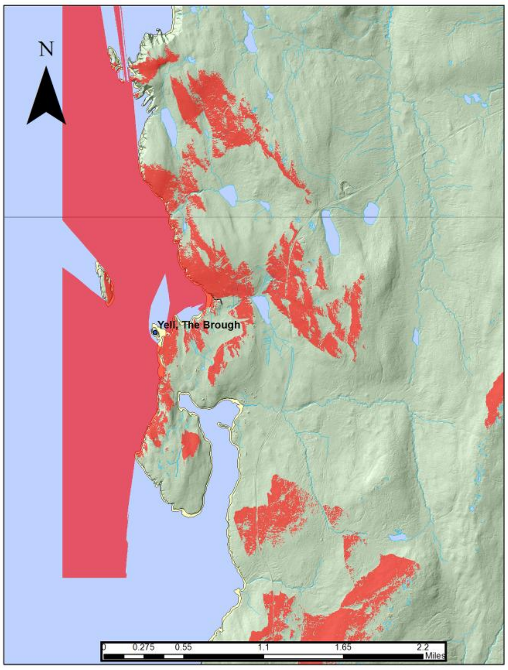


Figure 5.72. Sunrise (09:16 AM) to 14:00 PM around The Brough on the Winter Solstice (21st December). Red areas denote areas of shadow.

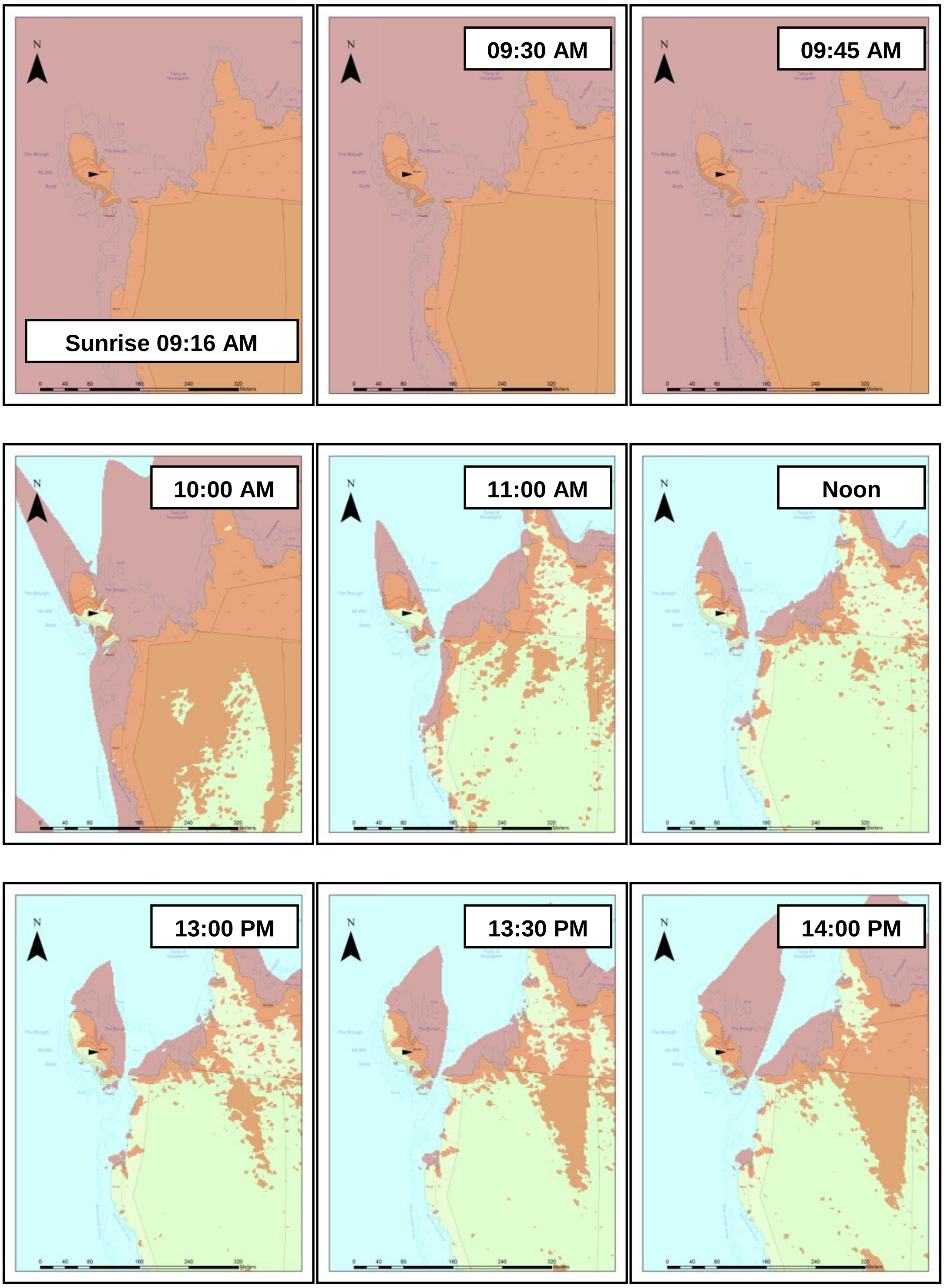


Figure 5.73. 14:15 PM to Sunset (14:49:50 PM) around The Brough on the Winter Solstice (21st December). Red areas denote areas of shadow.

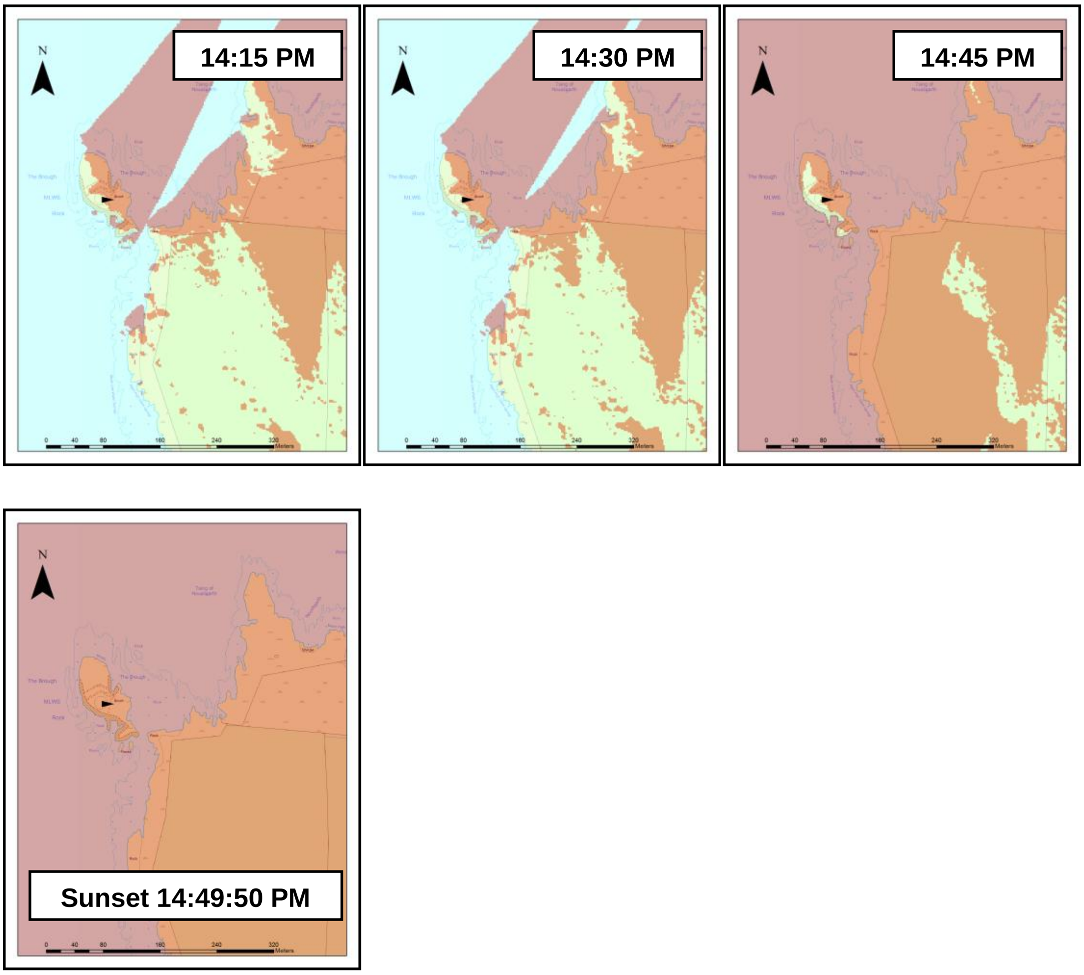


Figure 5.74. Sunrise (06:04:45 AM) to Noon around The Brough on the Spring Equinox (21st March). Red areas denote areas of shadow.

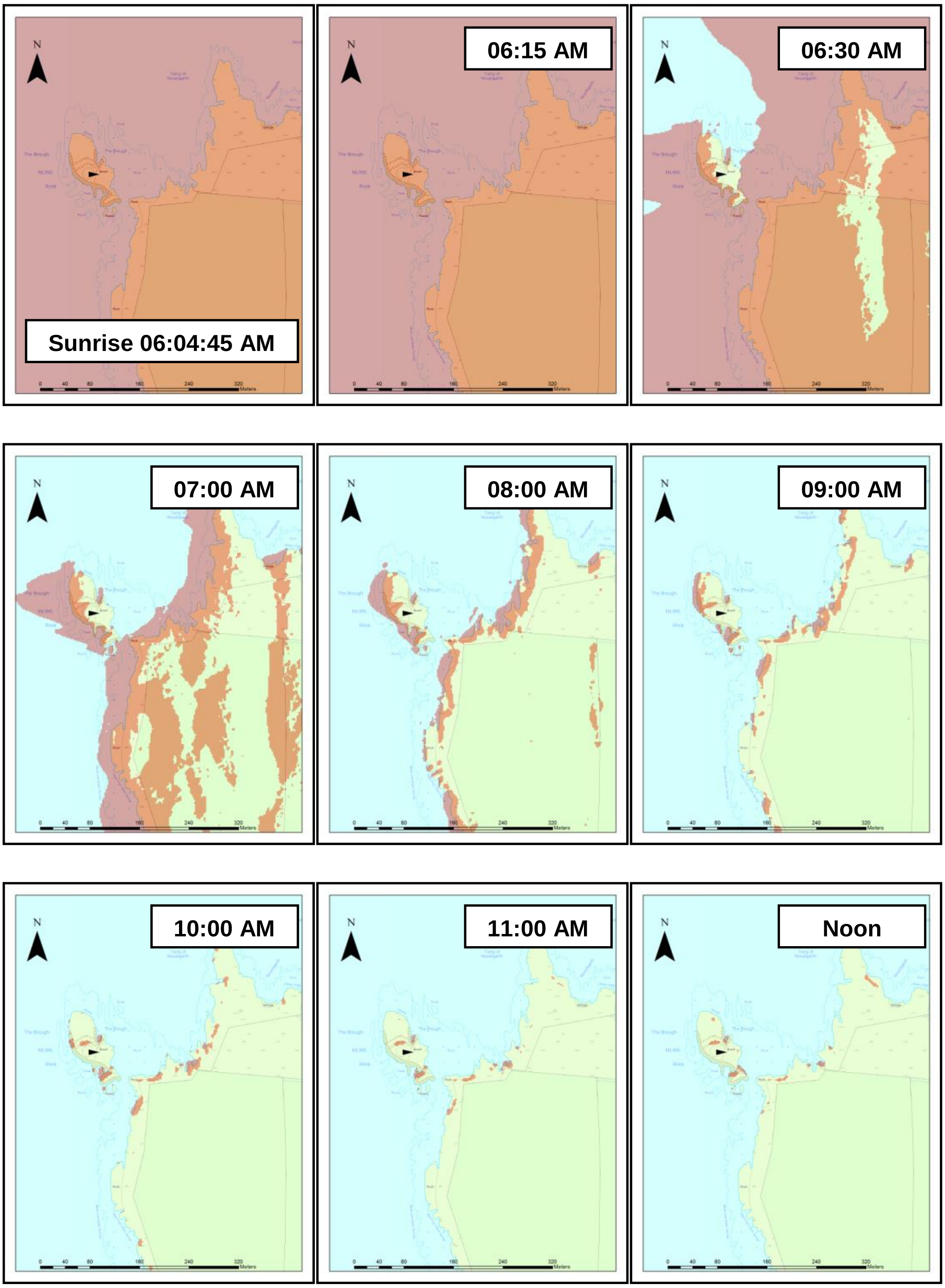


Figure 5.75.13:00 PM to Sunset (18:19:45 PM) around The Brough on the Spring Equinox (21st March). Red areas denote areas of shadow.

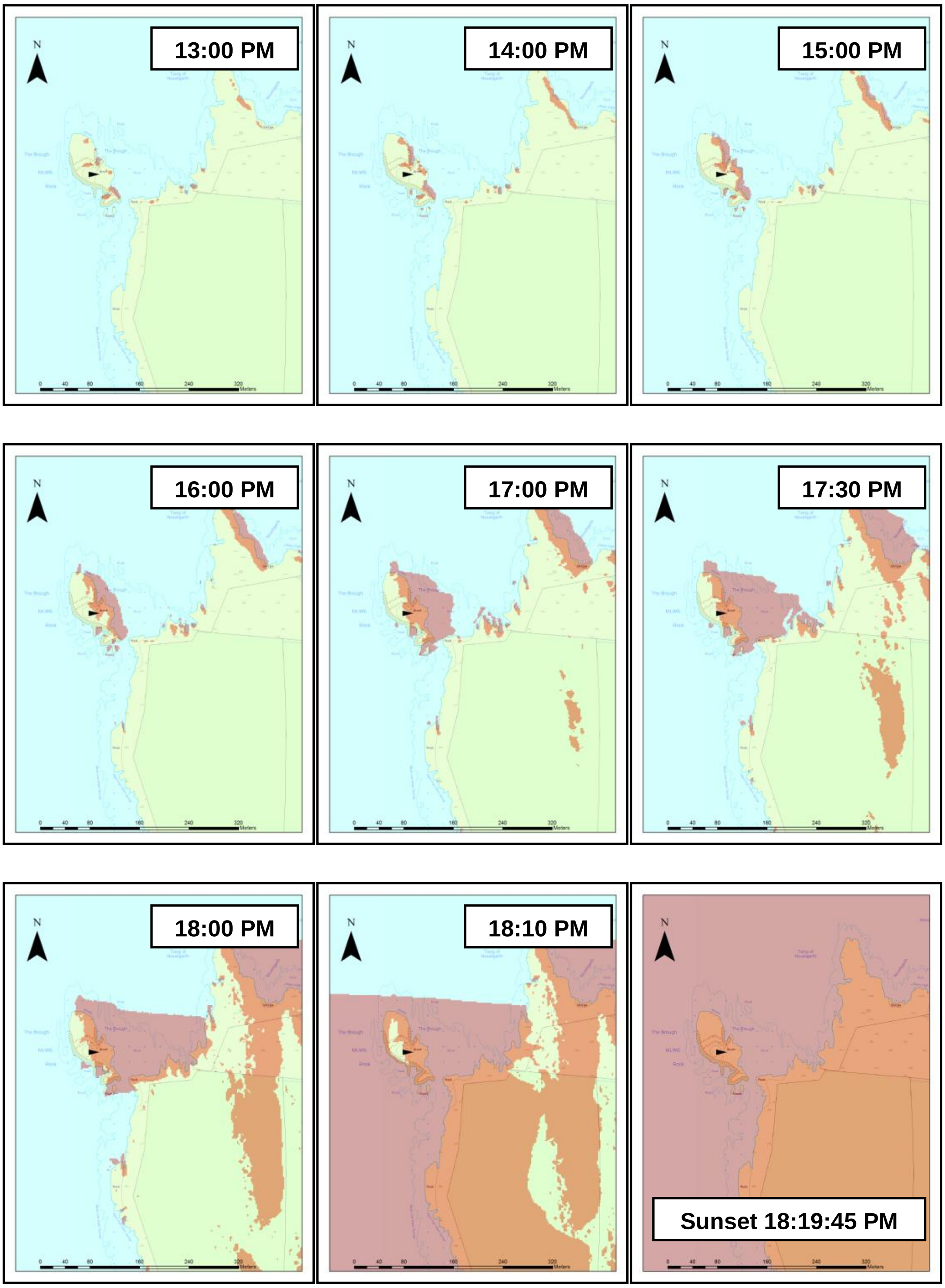


Figure 5.76. Sunrise (02:36:50 AM) to 08:00 AM around The Brough on the Summer Solstice (21st June). Red areas denote areas of shadow.

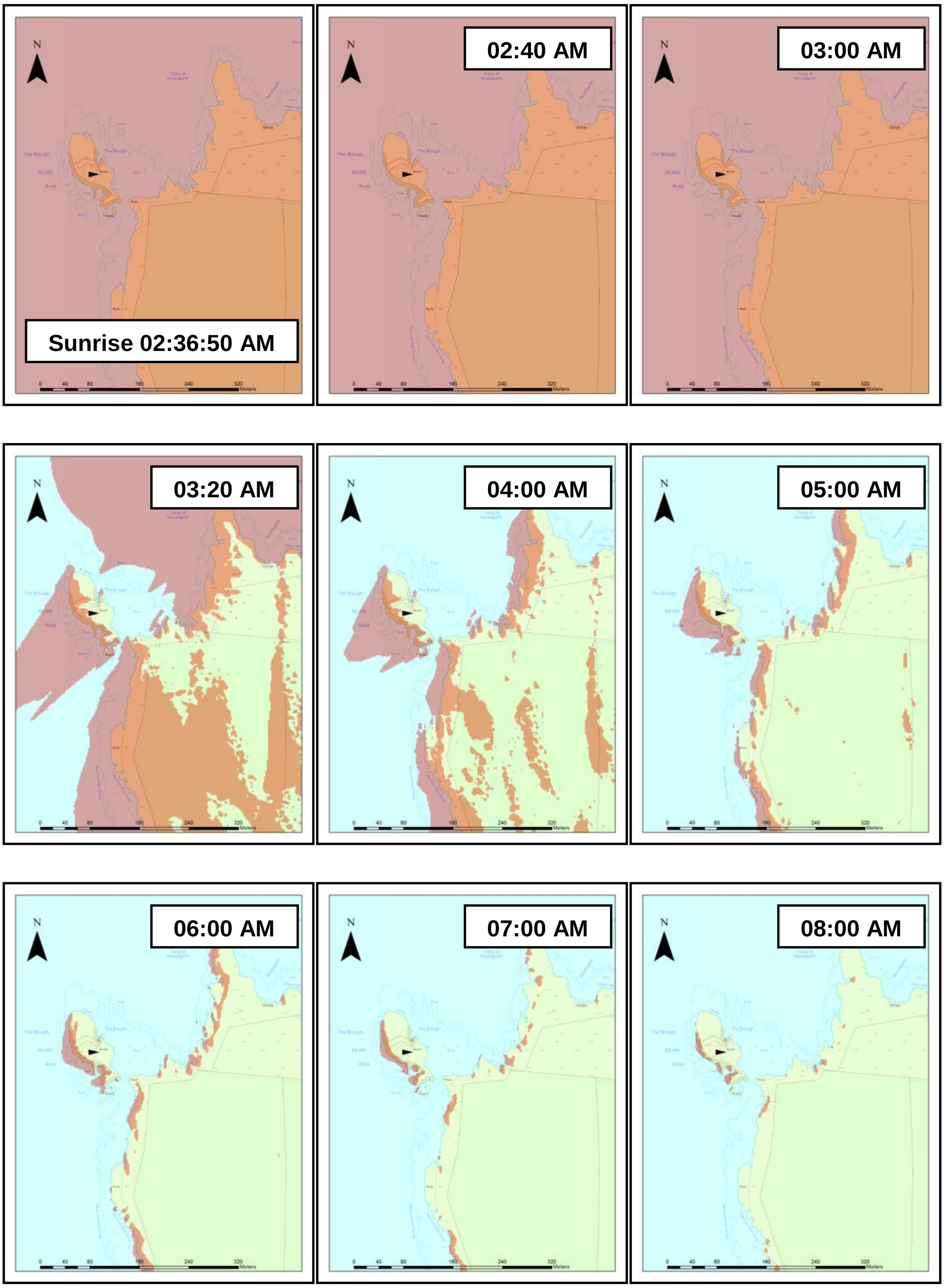


Figure 5.77. 09:00 AM to 17:00 PM around The Brough on the Summer Solstice (21st June). Red areas denote areas of shadow.

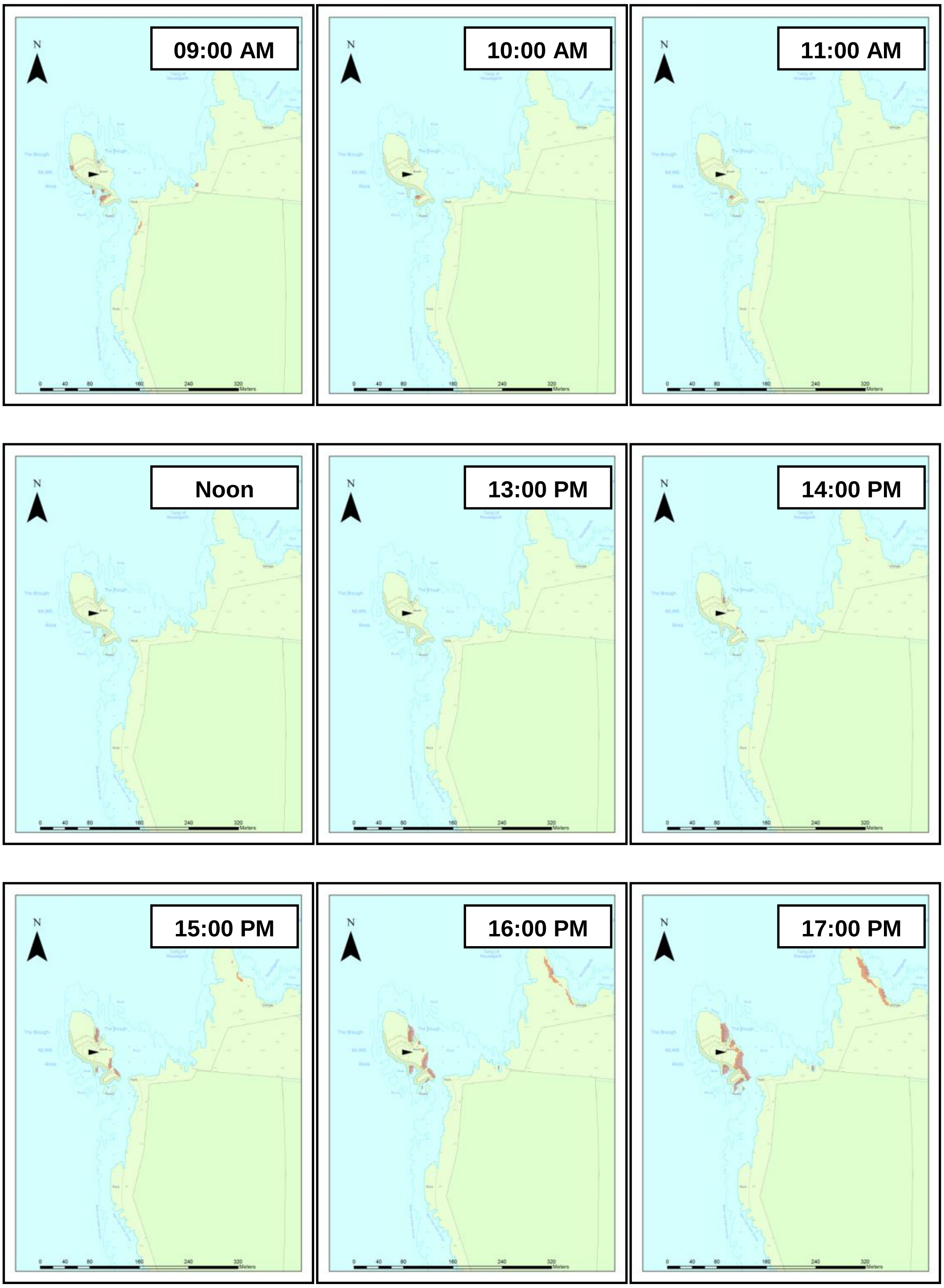
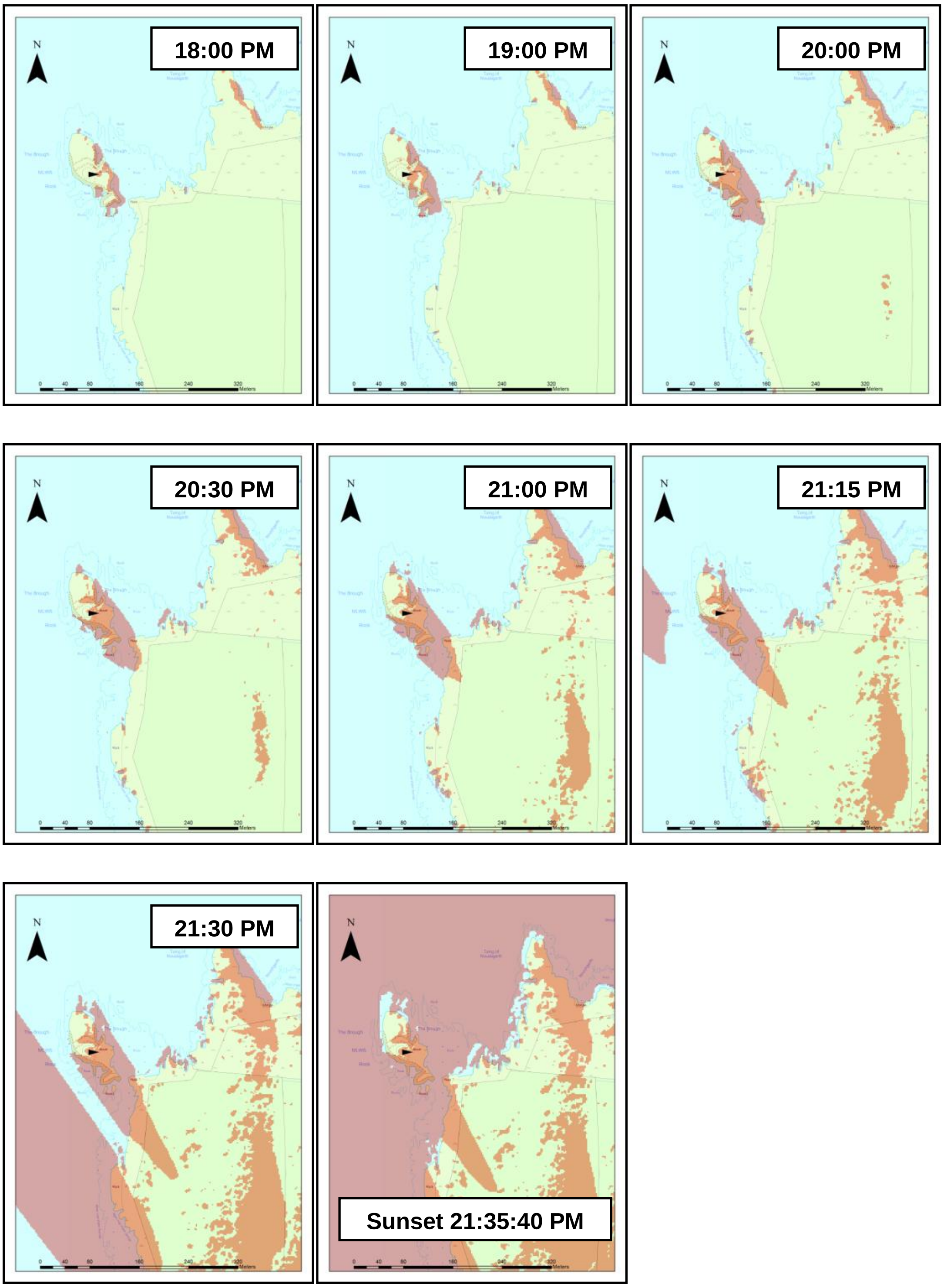


Figure 5.78. 18:00 PM to Sunset (21:35:40 PM) around The Brough on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 8: St Rognvald’s

Canmore ID: 1442

Entrance: E

The Broch and its Landscape Context

Located on the south coast of the island of Fetlar, this broch is situated on flat ground near the church at Feal, with its entrance towards the east (RCAHMS 1946: 56). Lacking much of any view of the island of Fetlar itself (Figure 5.79), it does possess a full and somewhat commanding view of the main natural harbour on Fetlar – Wick of Tresta; again suggesting a maritime focus. As it is located overlooking this harbour, it also has views down much of the north-west coastline of Shetland Mainland, extending down towards the island of Whalsay, about 16 miles to the south.

The Winter Solstice (21st December) – Figures 5.80 and 5.81

Unusually, this broch receives direct sunlight at sunrise, and within ten minutes of the sun rising, the broch and much of its landscape receives direct light. It retains this for much of the day, until around thirty minutes before sunset, when the south-western side of the broch falls into the shade. For the winter then, an eastern entrance would have retained more light than a western, though an entrance slightly towards the SE would have benefited more.

The Equinox (21st March) – Figures 5.82 and 5.83

Within ten minutes after sunrise, the broch’s entrance would have gained direct sunlight, and is one of the first areas in the immediate landscape to receive direct light. Within another ten minutes, the flat area of ground on which the broch sits also gains light, and retains it for the day. The slightly raised ground where the broch is located means that as the sun begins to set at 18:00 PM, the broch is able to retain direct light, whereas its immediate surroundings lose it. Within another ten minutes however, at 18:10 PM, the broch is in the shade, about ten minutes before sunset. During the spring and autumn equinoxes then, both an eastern or western entrance would have gained the same amount of light, with both losing a marginal amount of direct light during the morning and afternoon.

The Summer Solstice (21st June) Figures 5.84, 5.85 and 5.86

It takes at least forty minutes for the site to gain light during midsummer, but by 04:00 AM, the broch and its landscape gains direct sunlight, retaining it for the day. Around 20:30 PM, shadow encroaches on the landscape around the broch, and just after 21:00 PM, the broch, on higher ground, finally loses its light, around thirty minutes before sunset. For the summer then, a western entrance would probably gain mere minutes more sunlight than an eastern.

Conclusion

Throughout the year, this site gains sunlight throughout much of the day, losing only a little in the mornings and afternoons. The eastern entrance, avoiding the prevailing winds, is well suited to all seasons however, and this may be the reason why it was selected over a western entrance, while also suggesting that the morning light was important for the inhabitants of this broch.

Figure 5.79. Multiple Viewsheds of St Rognvald's Broch.

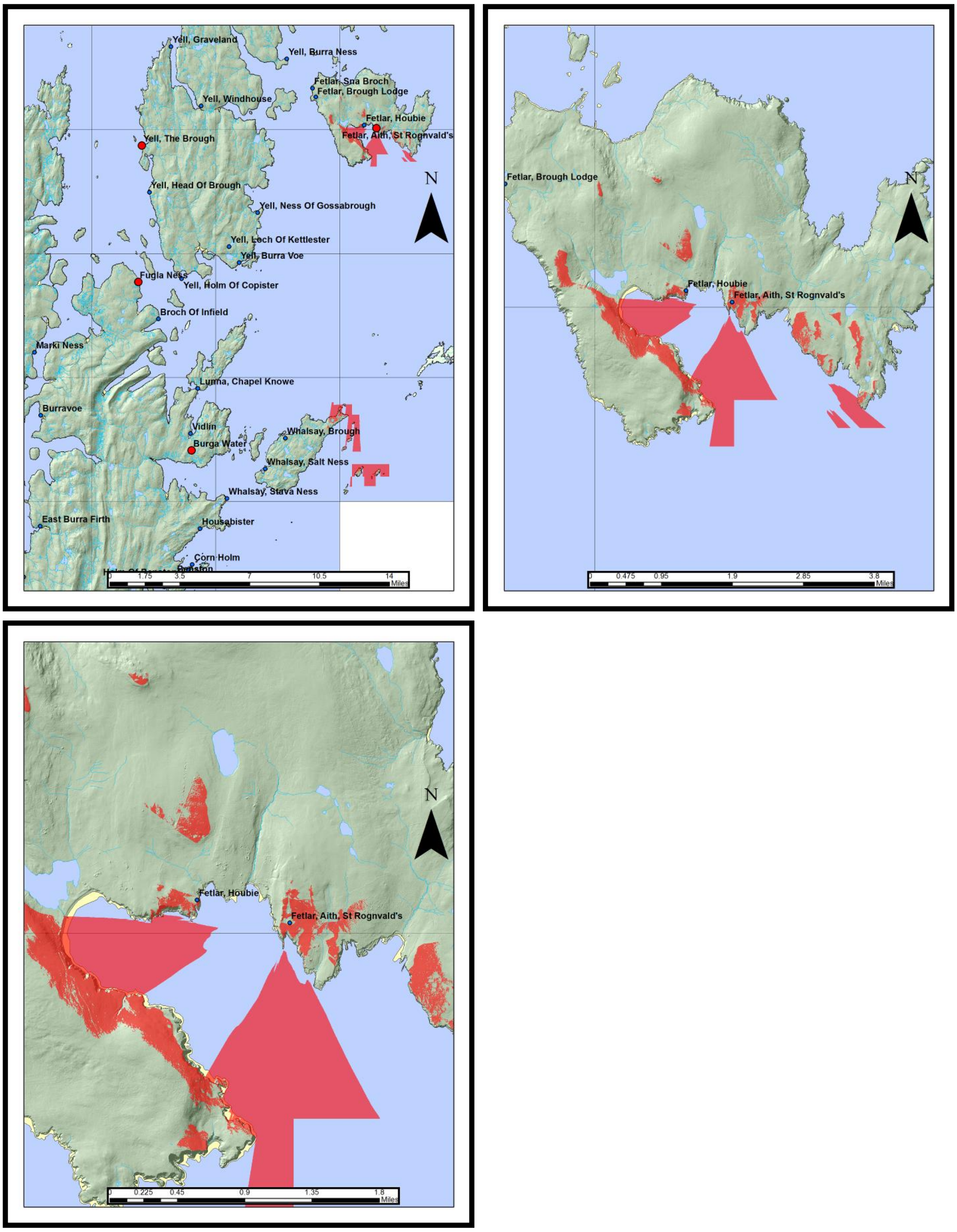


Figure 5.80. Sunrise (09:16 AM) to 14:00 PM around St Rognvald's on the Winter Solstice (21st December). Red areas denote areas of shadow.

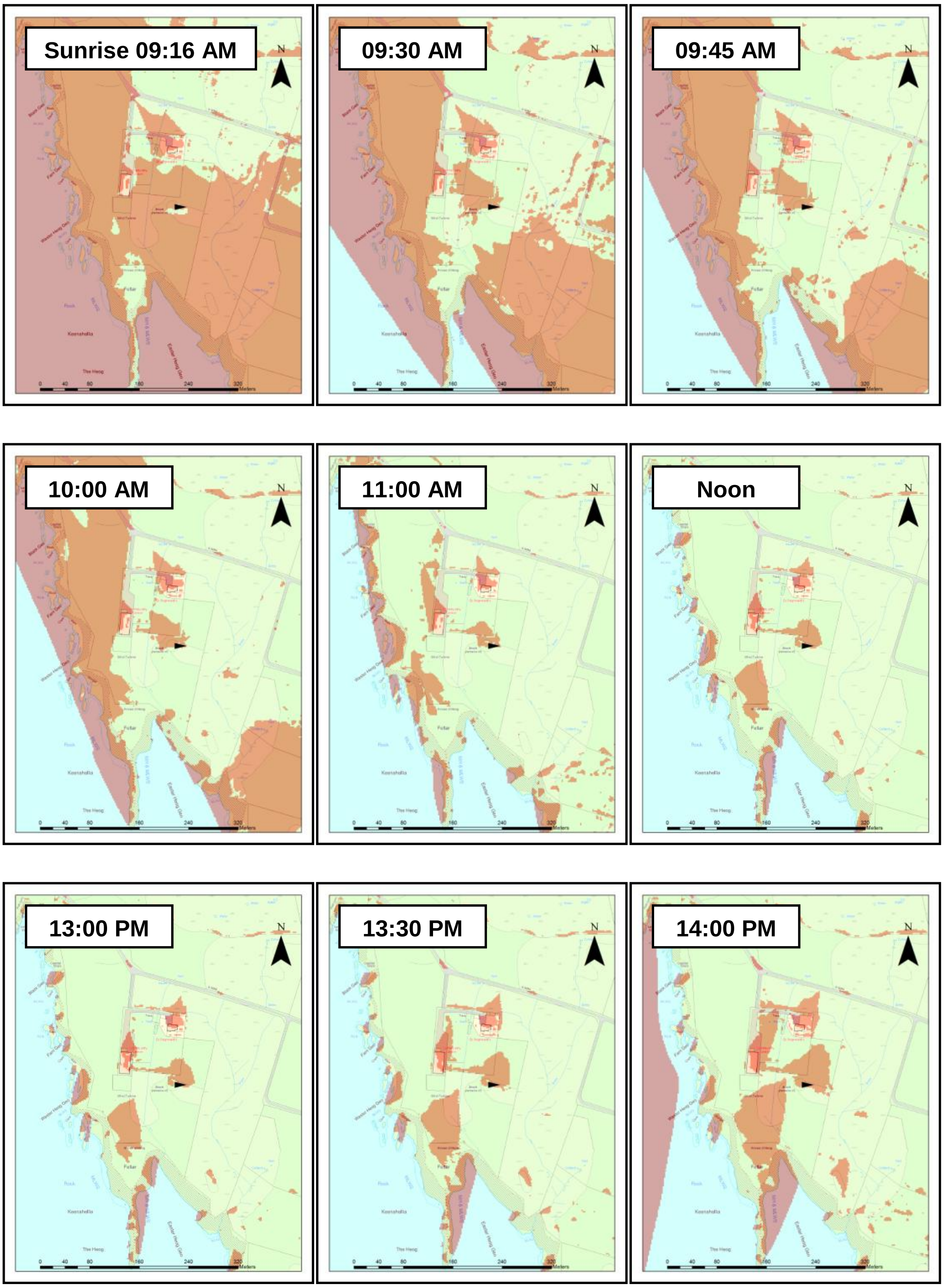


Figure 5.81. 14:15 PM to Sunset (14:49:50 PM) around St Rognvald's on the Winter Solstice (21st December). Red areas denote areas of shadow.

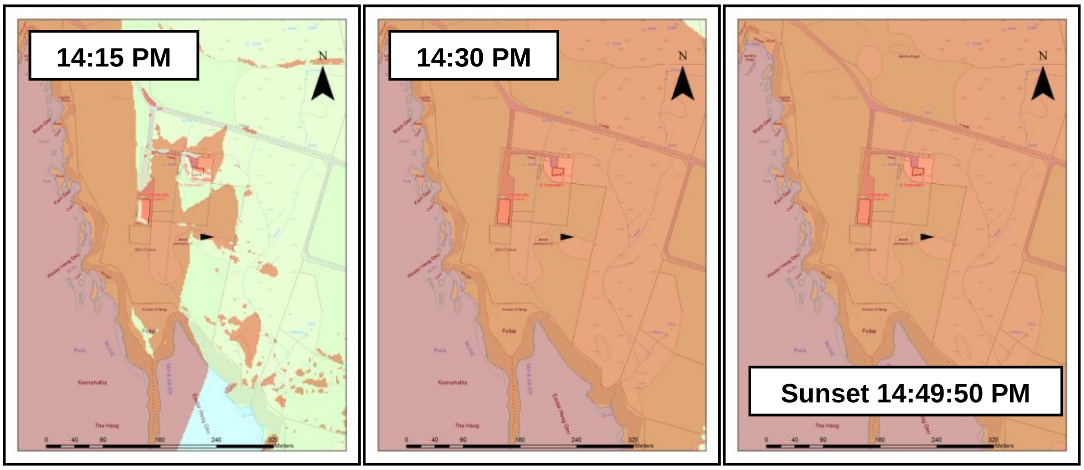


Figure 5.82. Sunrise (06:04:45 AM) to Noon around St Rognvald's on the Spring Equinox (21st March). Red areas denote areas of shadow.

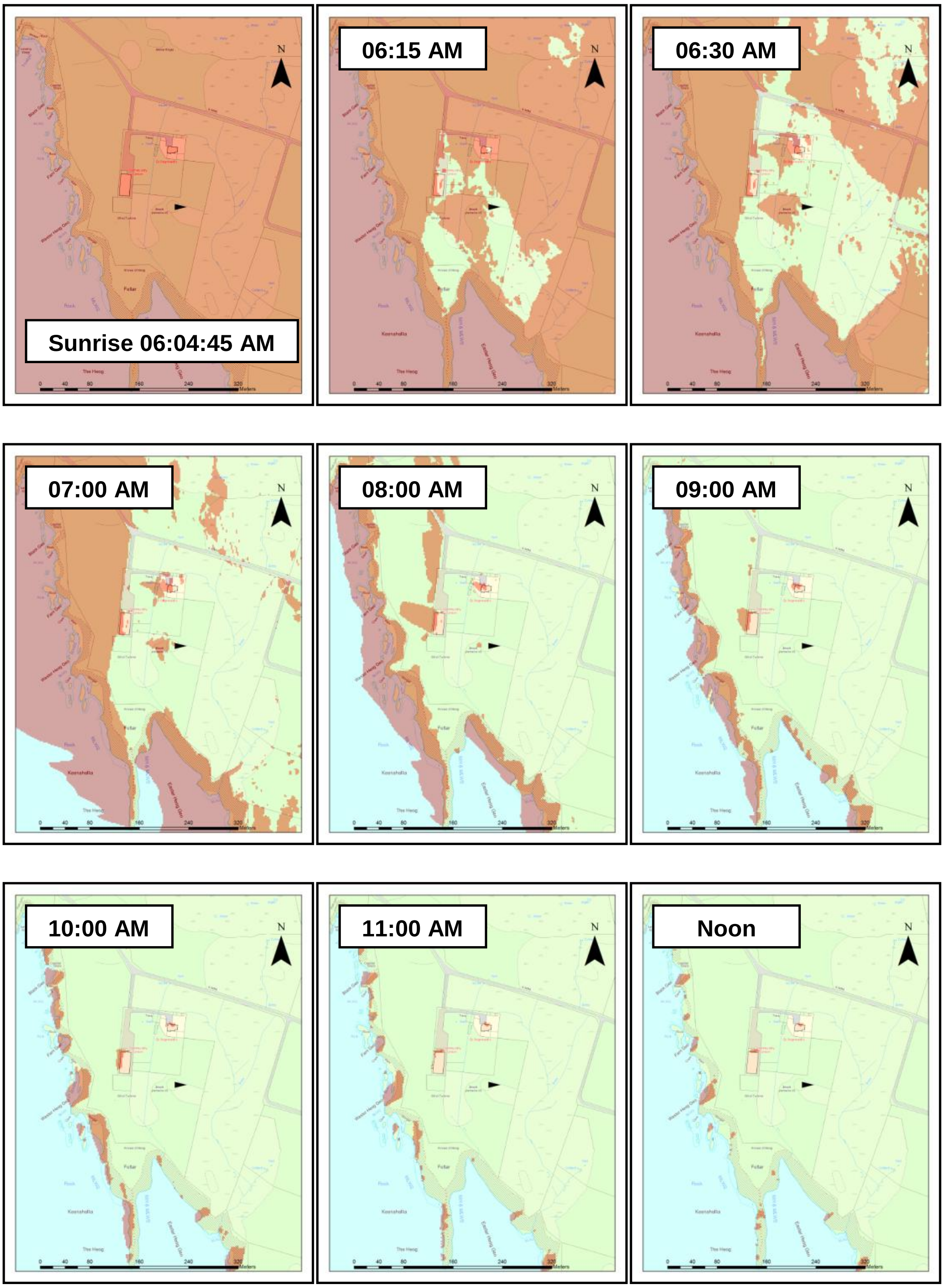


Figure 5.83. 13:00 PM to Sunset (18:19:45 PM) around St Rognvald's on the Spring Equinox (21st March). Red areas denote areas of shadow.

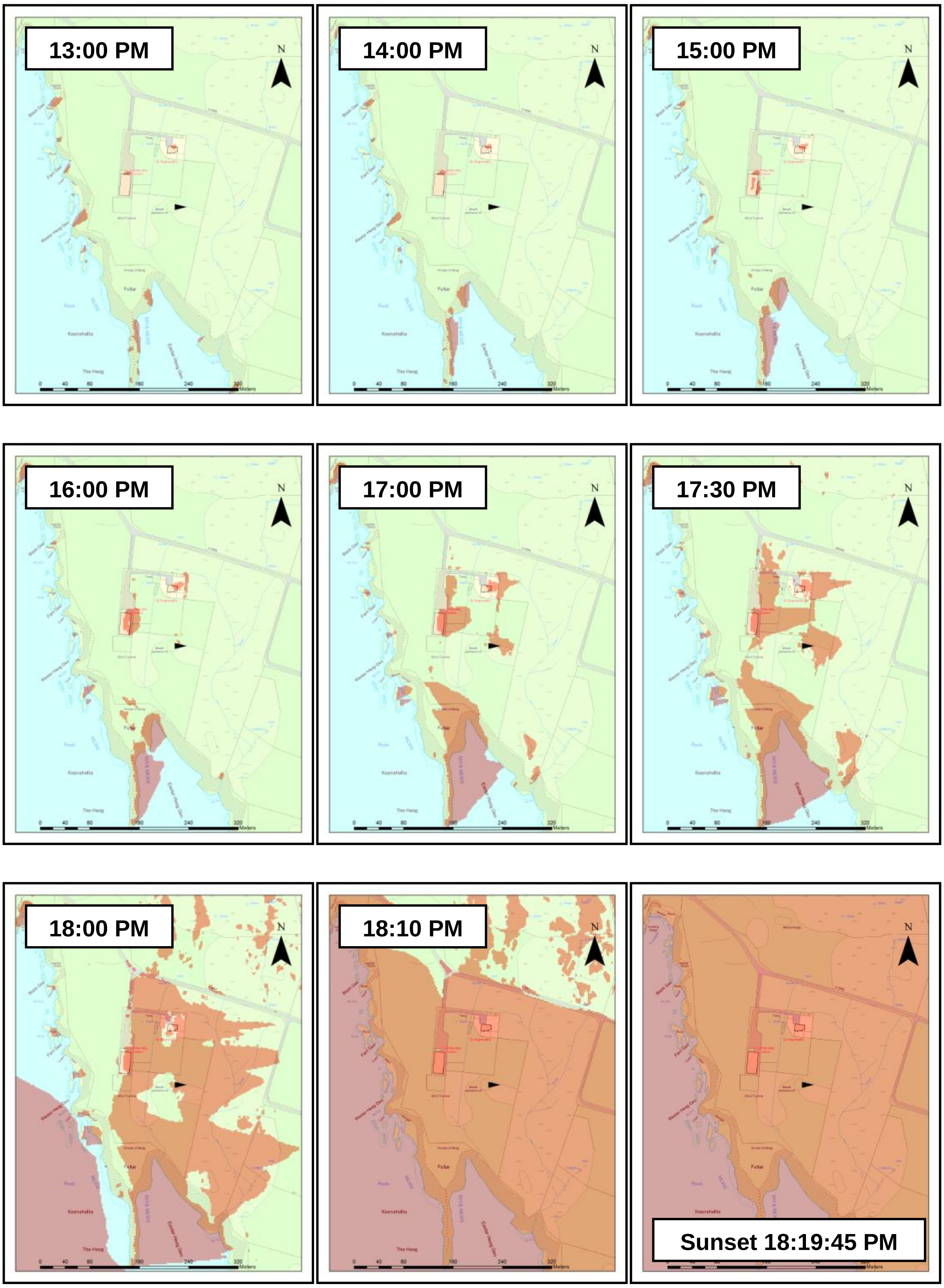


Figure 5.84. Sunrise (02:36:50 AM) to 09:00 AM around St Rognvald's on the Summer Solstice (21st June). Red areas denote areas of shadow.

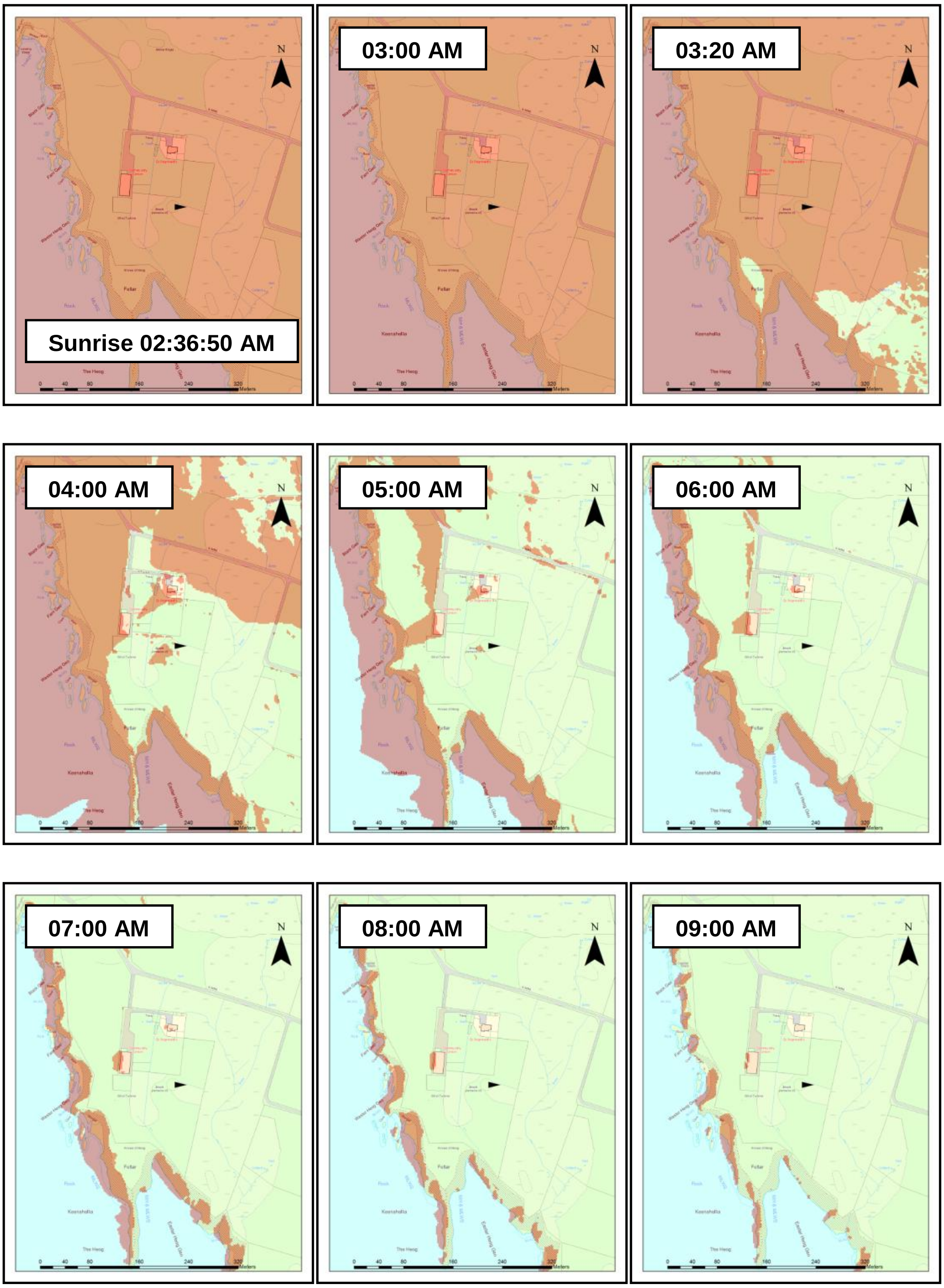


Figure 5.85. 10:00 AM to 18:00 PM around St Rognvald's on the Summer Solstice (21st June). Red areas denote areas of shadow.

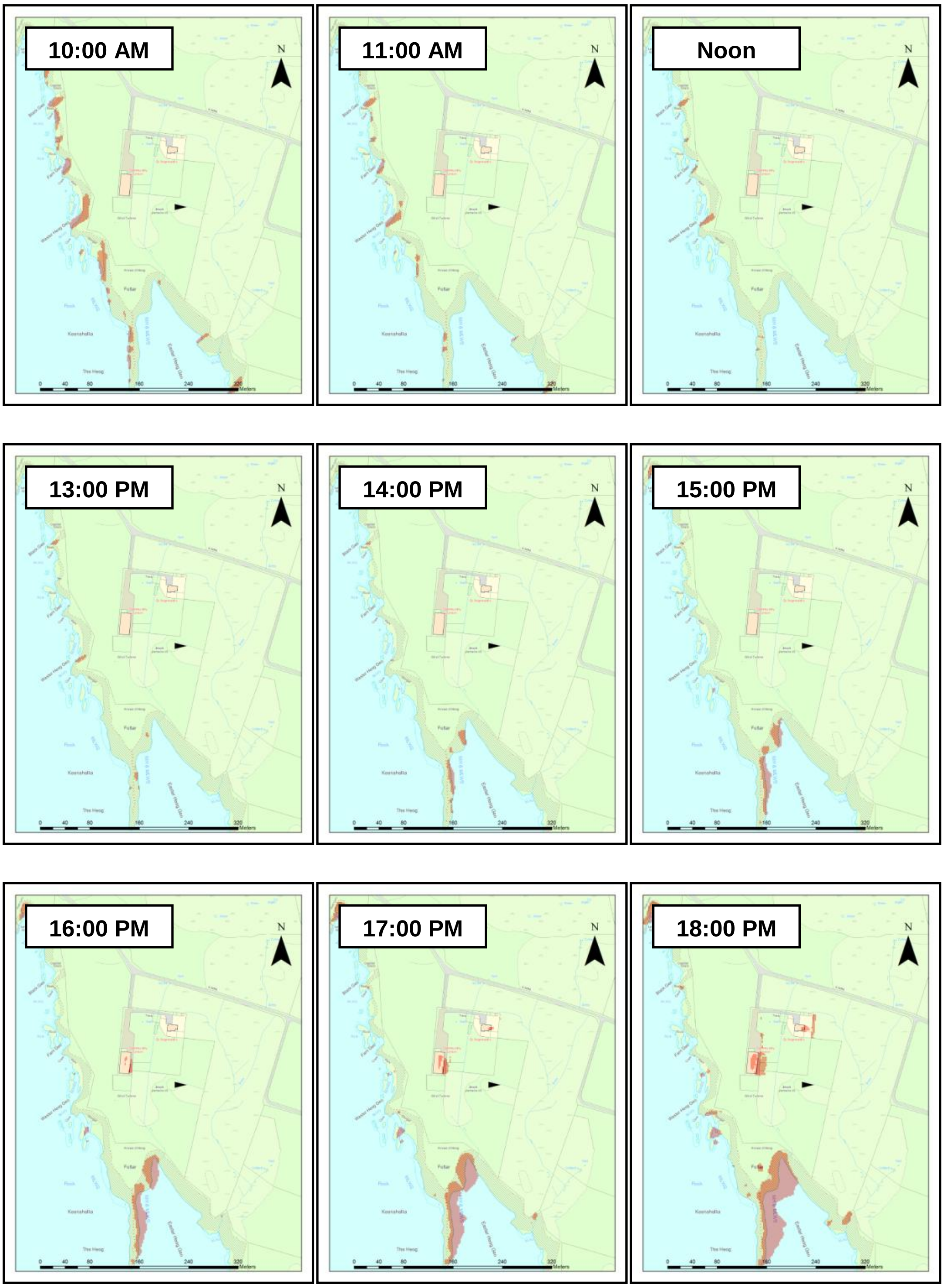
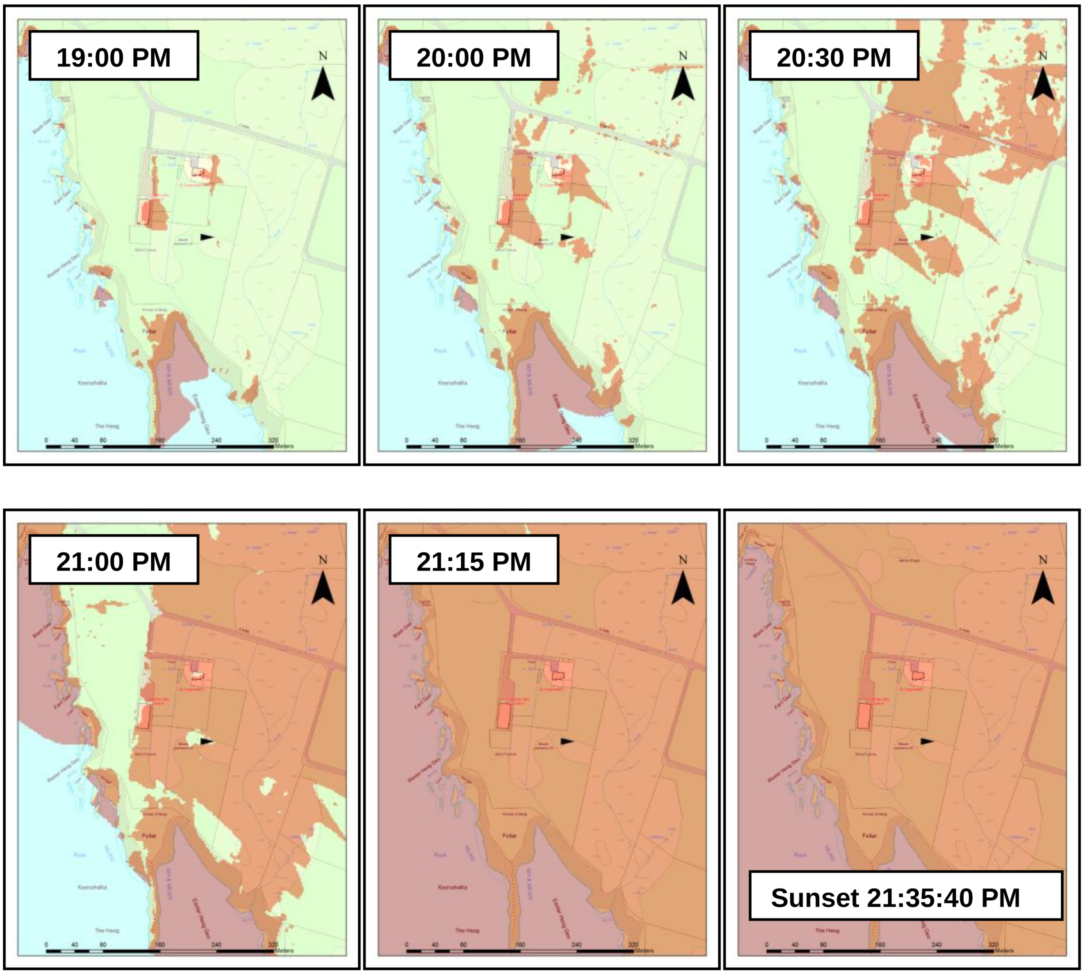


Figure 5.86.19:00 PM to Sunset (21:35:40 PM) around St Rognvald's on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 9: Clumlie Broch, South Mainland

Canmore ID: 909

Entrance: SE

The Broch and its Landscape Context

Excavated by Goudie (1904: 26-28; cf. RCAHMS 1946: 25-26) in 1887, Clumlie broch possesses a SE facing entrance and stands on a low rise on flat arable ground (see Figures 5.87, 5.88, and 5.89). As it lies away from the sea, it could simply be that a SE entrance was permitted because the winds coming off the sea become weaker as they travel further inland.

As we see in Figure 5.90, Clumlie's possesses somewhat marginal views of the sea; which may be significant and may suggest a focus on the land. Indeed, lying on a slight ridge, Clumlie is given fairly good views of the land, and this represents a contrast with many other brochs near the coast. And so, unlike other sites, such as Levenwick and Mousa, visitors to Clumlie would probably have arrived by land, having perhaps landed on a beach in a neighbouring broch territory, such as Dalsetter. This may be the reason why the only other broch just about visible at Clumlie is Dalsetter to the south.

The Winter Solstice – Figures 5.91 and 5.92

This broch's raised position permits excellent light availability. Interestingly, as the sun rises in the south-east during the winter solstice, the broch is one of the few places that immediately gains direct sunlight, probably lighting the interior of the broch itself. Ten minutes later, the south-eastern side of the broch gains direct sunlight. The fact that it is on a south facing slope means that throughout the morning, the broch continues to receive direct sunlight. However, by 14:45 PM, the broch is no longer in the sun, and by sunset, the entire landscape around it is in the shade.

The Equinox (21st March) – Figures 5.93 and 5.94

Again, at sunrise, the broch's eastern half is immediately illuminated, and continues to be so throughout much of the day. By 06:30 AM, much of the eastern half of the landscape is in light. By 08:00 AM the landscape around the broch is in direct sunlight and remains so until around 17:30 PM, when the sun begins to set. By 18:00 PM however, the western hills force the broch and its surrounding landscape into the shade for the remaining half hour until sunset.

The Summer Solstice (21st June) Figures 5.95, 5.96 and 5.97

During the summer, the small hills to the NE of the site mean that the site is not directly illuminated at sunrise, but by 04:00 AM, it receives direct light. Clumlie's position on a small ridge on a flat plane means that the landscape around it, including the broch itself, receives light throughout the day. Around 20:00 PM, the eastern side of the broch begins to fall into shadow, but by 21:00 PM, the entire landscape is in the shade, half an hour before actual sunset.

Conclusion

Again, the broch's orientation is well suited to the winter. An entrance to the SW would have allowed not quite as much light as its SE entrance does, and would have been orientated towards the prevailing winds as well. The hills to the west and north of the site also mean that the sun is obscured for the last hour of the day throughout the summer and spring. And so, a SE entrance was probably the best choice.

Figure 5.87. Remains of Clumlie Broch, facing SSE.
Author's Photo.

Figure 5.88. Looking SE through the entrance of Clumlie.
Author's Photo.

Figure 5.89. Ground Plan of Clumlie Broch.
(Crown Copyright: RCAHMS)

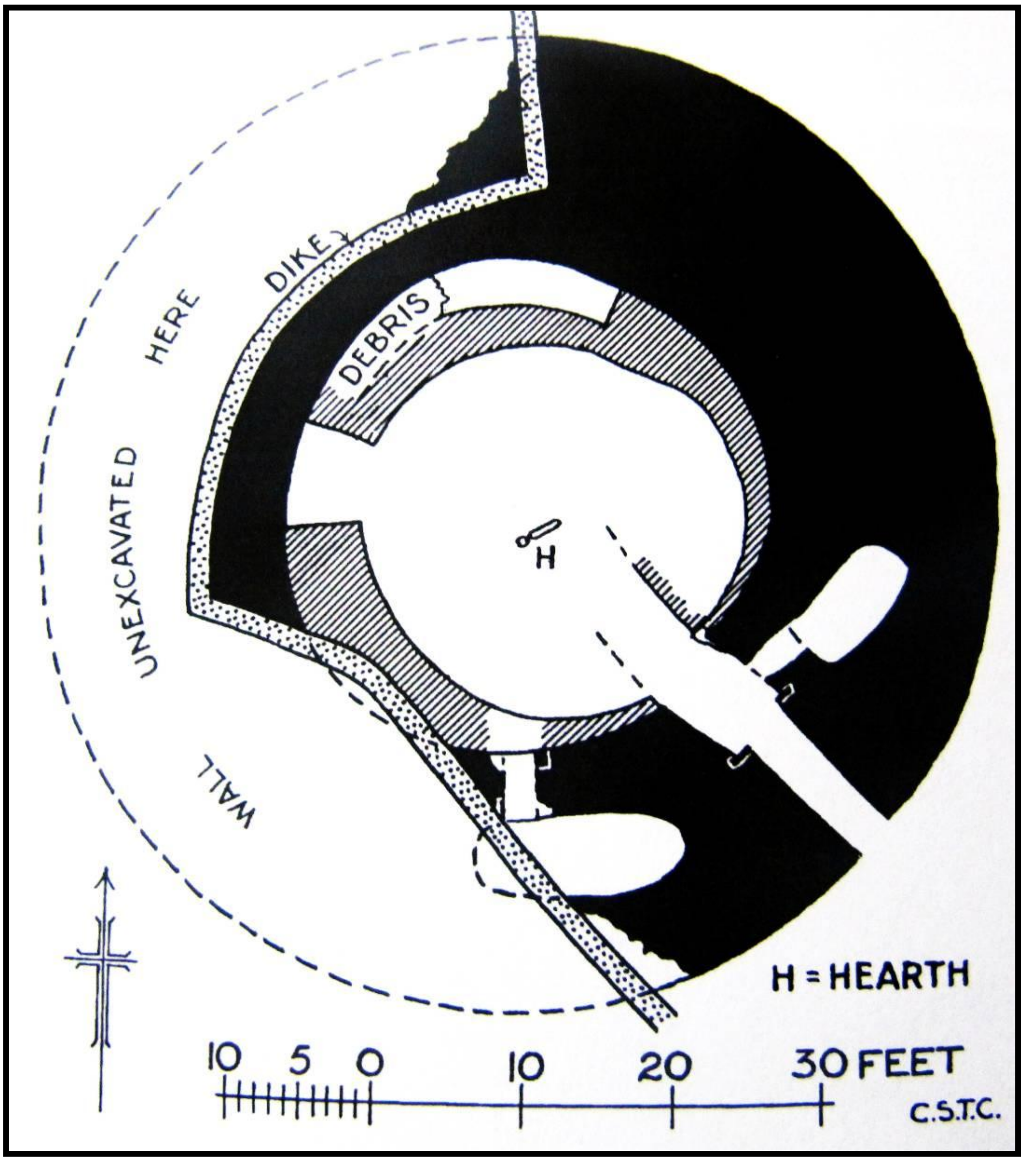


Figure 5.90. Multiple Viewsheds of Clumlie Broch.

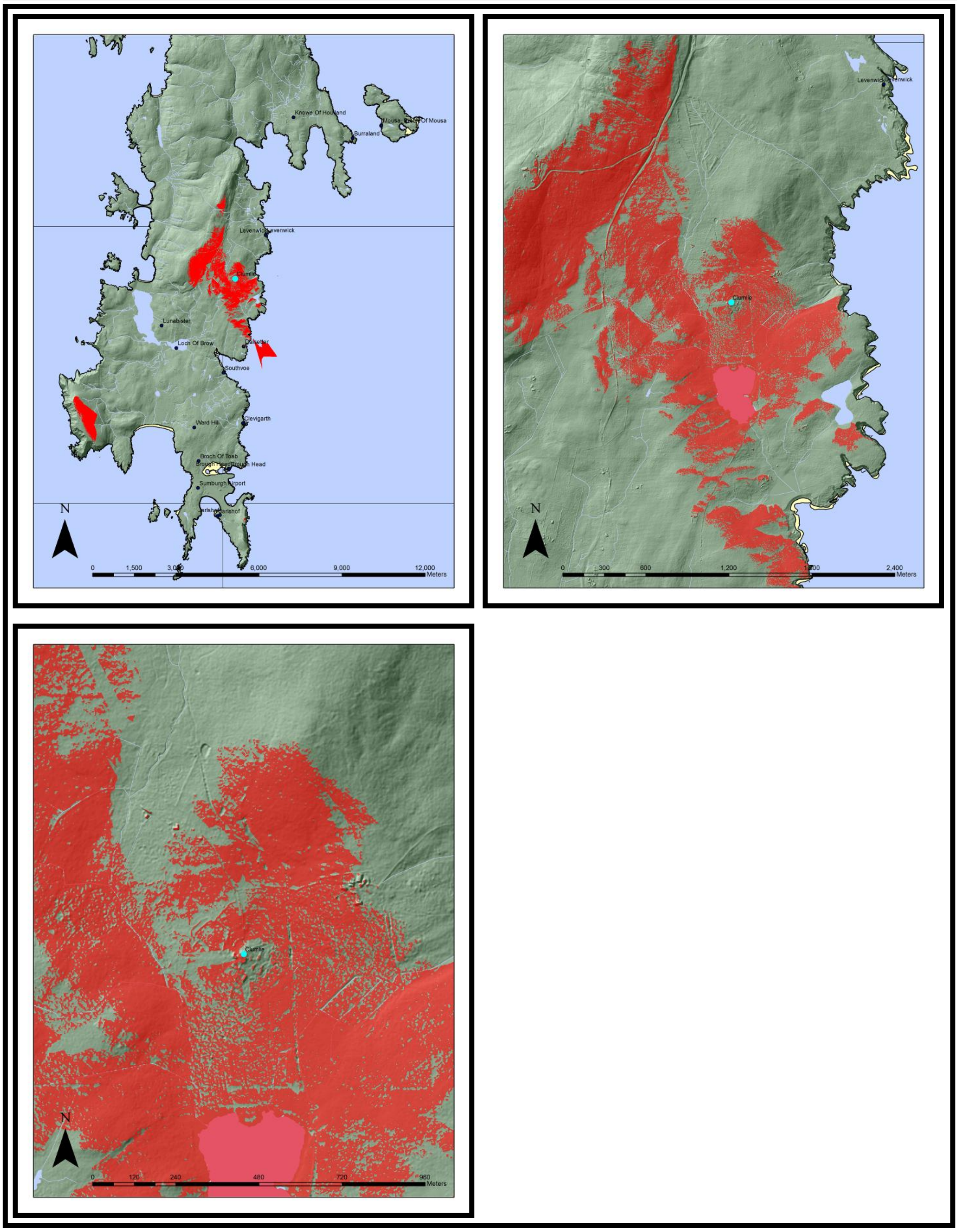


Figure 5.91. Sunrise (09:10 AM) to 14:39 PM around Clumlie on the Winter Solstice (21st December). Red areas denote areas of shadow.

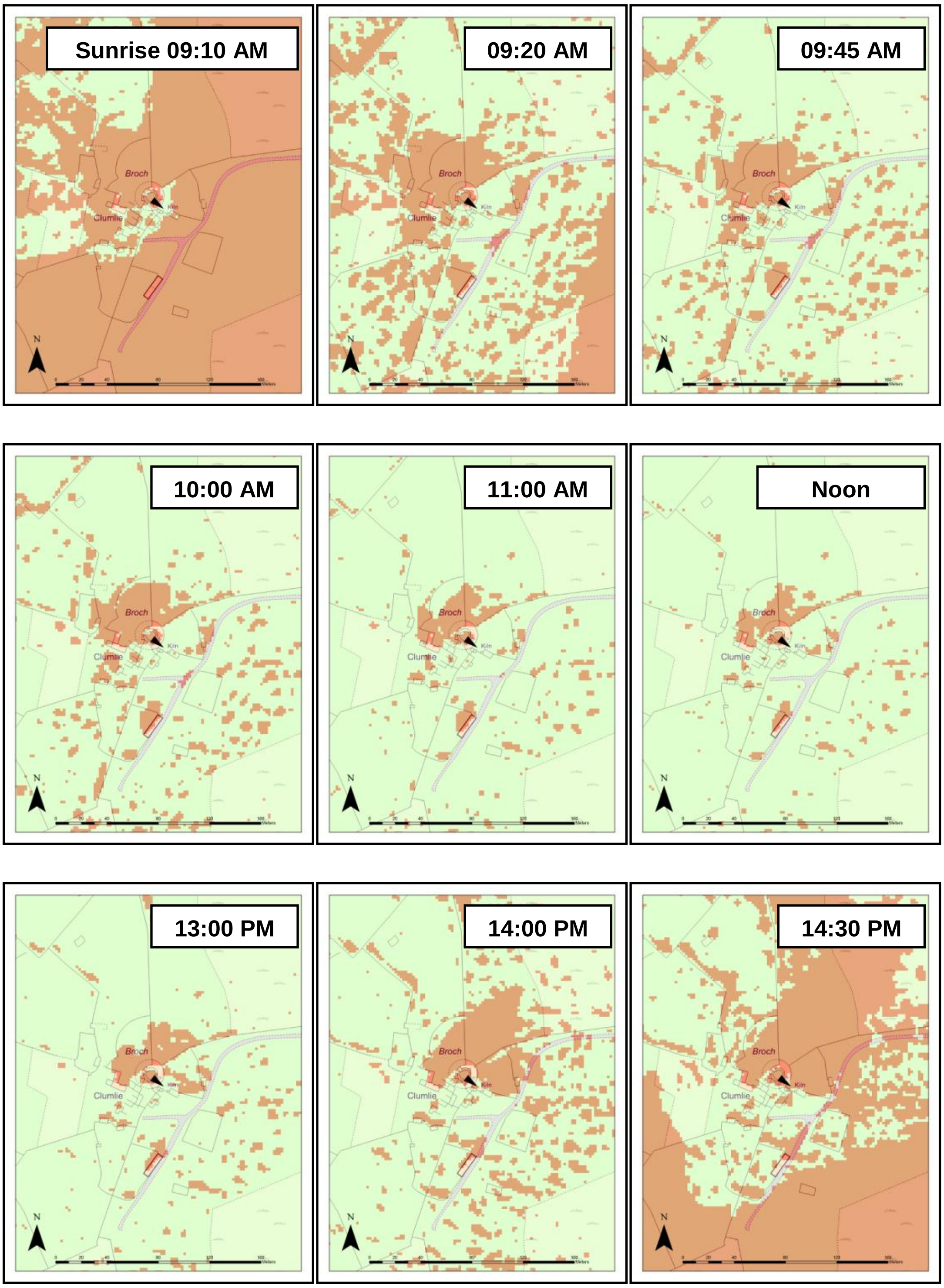


Figure 5.92. 14:45 PM to Sunset (14:55:45 PM) around Clumlie on the Winter Solstice (21st December). Red areas denote areas of shadow.

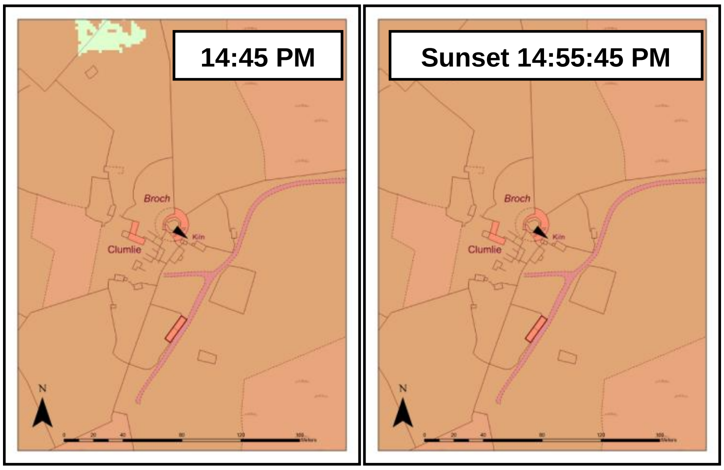


Figure 5.93. Sunrise (06:05:10 AM) to Noon around Clumlie on the Spring Equinox (21st March). Red areas denote areas of shadow.

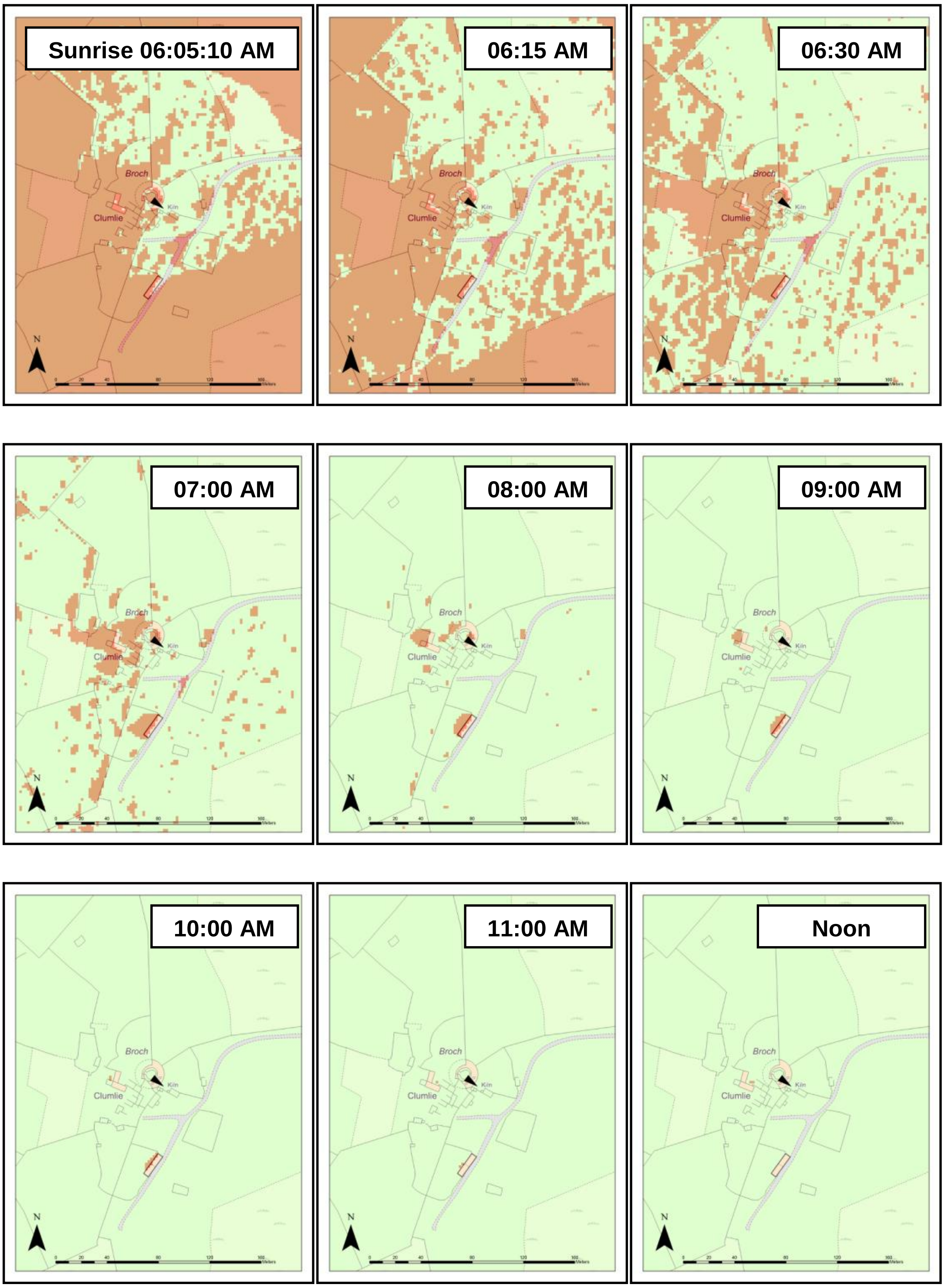


Figure 5.94. 13:00 PM to Sunset (18:29:50 PM) around Clumlie on the Spring Equinox (21st March). Red areas denote areas of shadow.

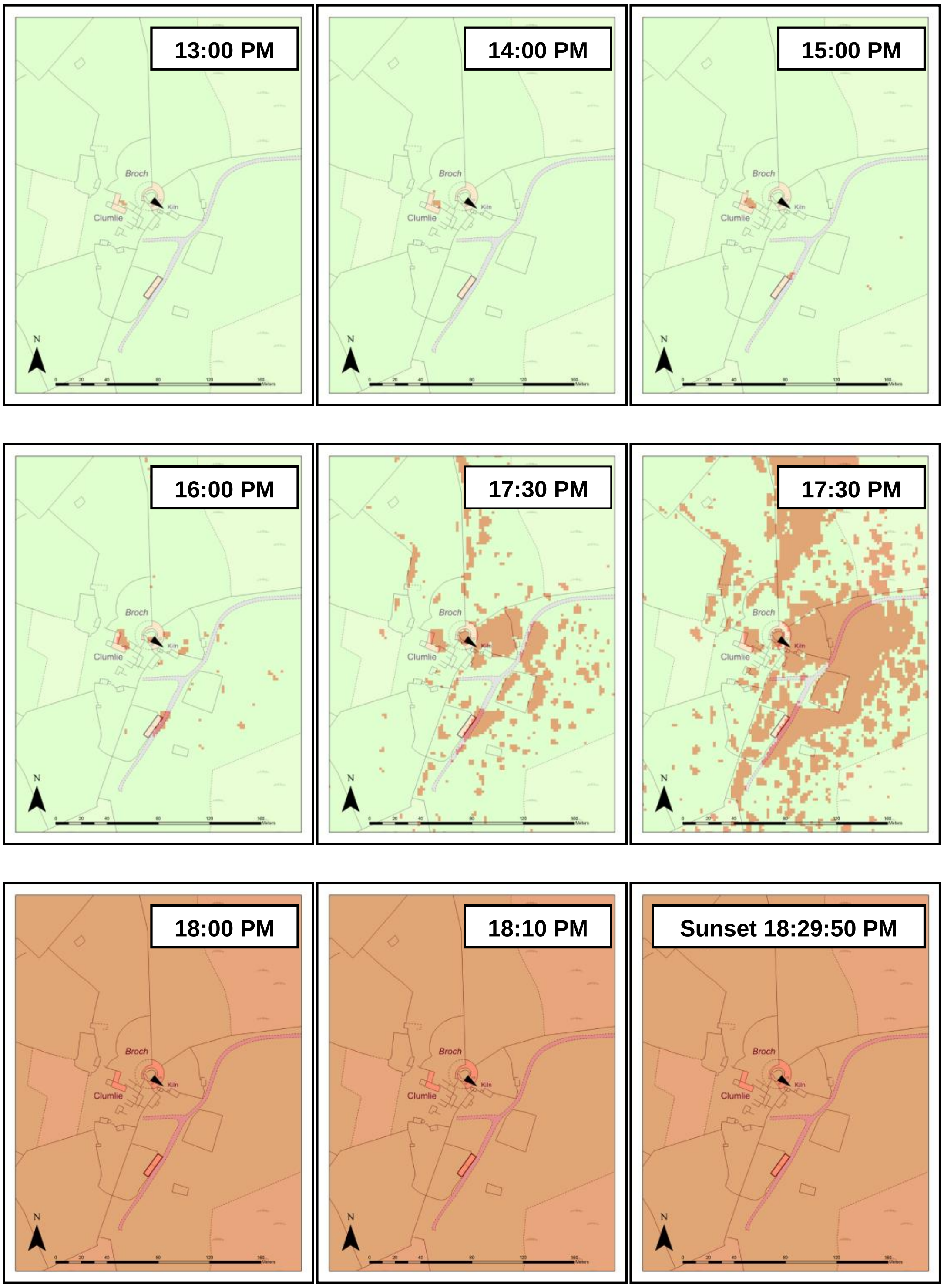


Figure 5.95. Sunrise (02:44:10 AM) to 10.00 AM around Clumlie on the Summer Solstice (21st June). Red areas denote areas of shadow.

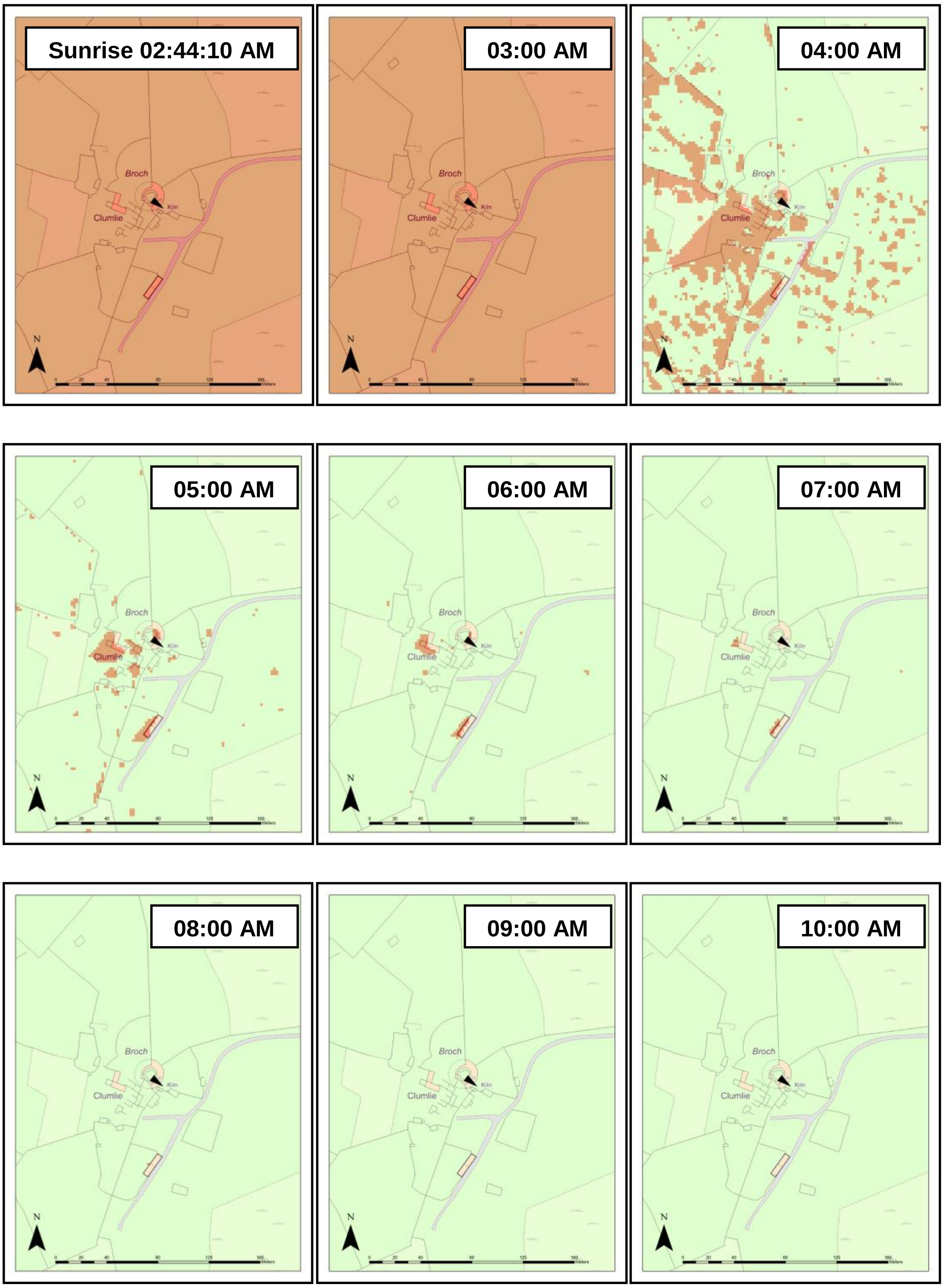


Figure 5.96. 11:00 AM to 19:00 PM around Clumlie on the Summer Solstice (21st June). Red areas denote areas of shadow.

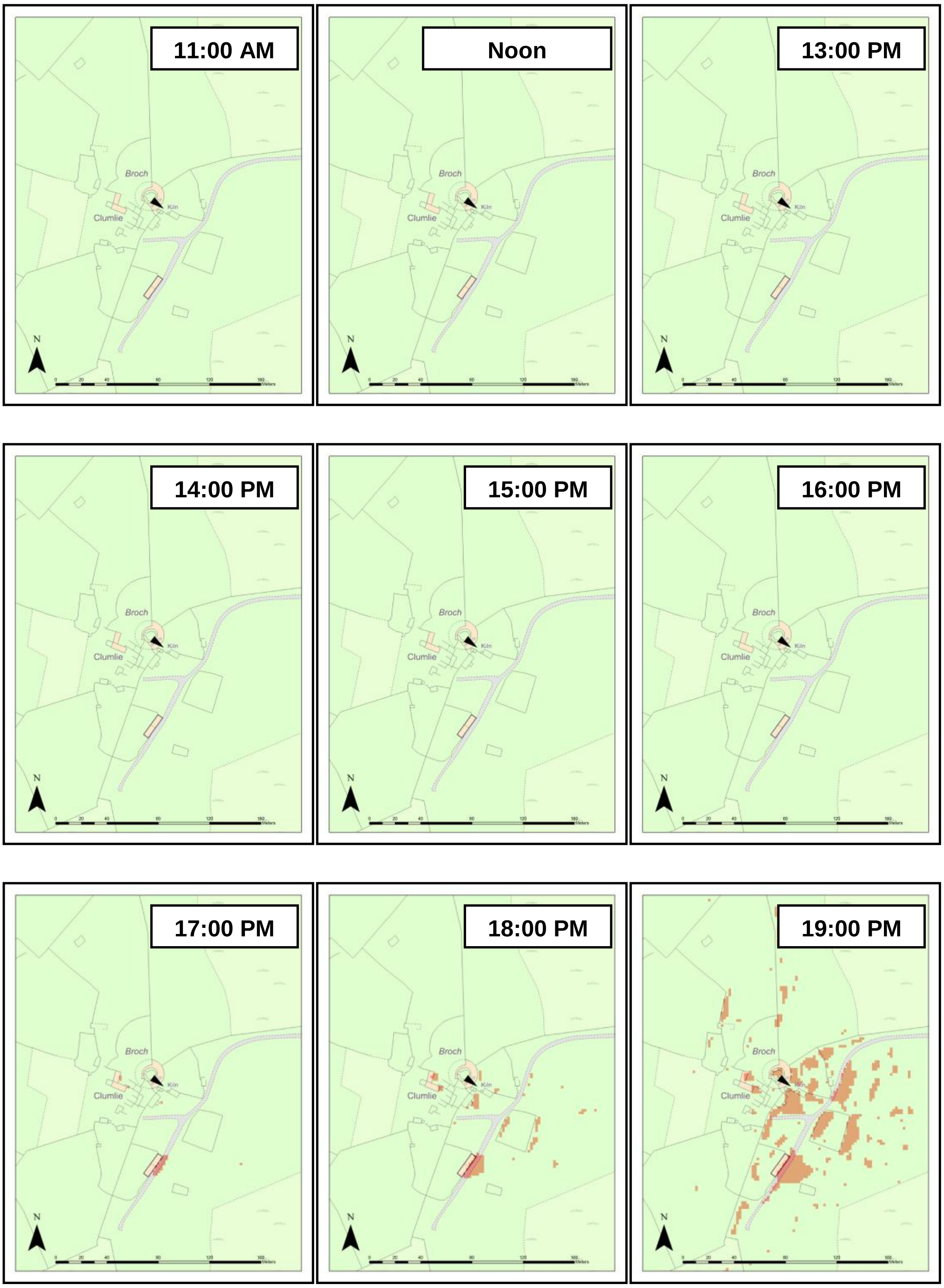
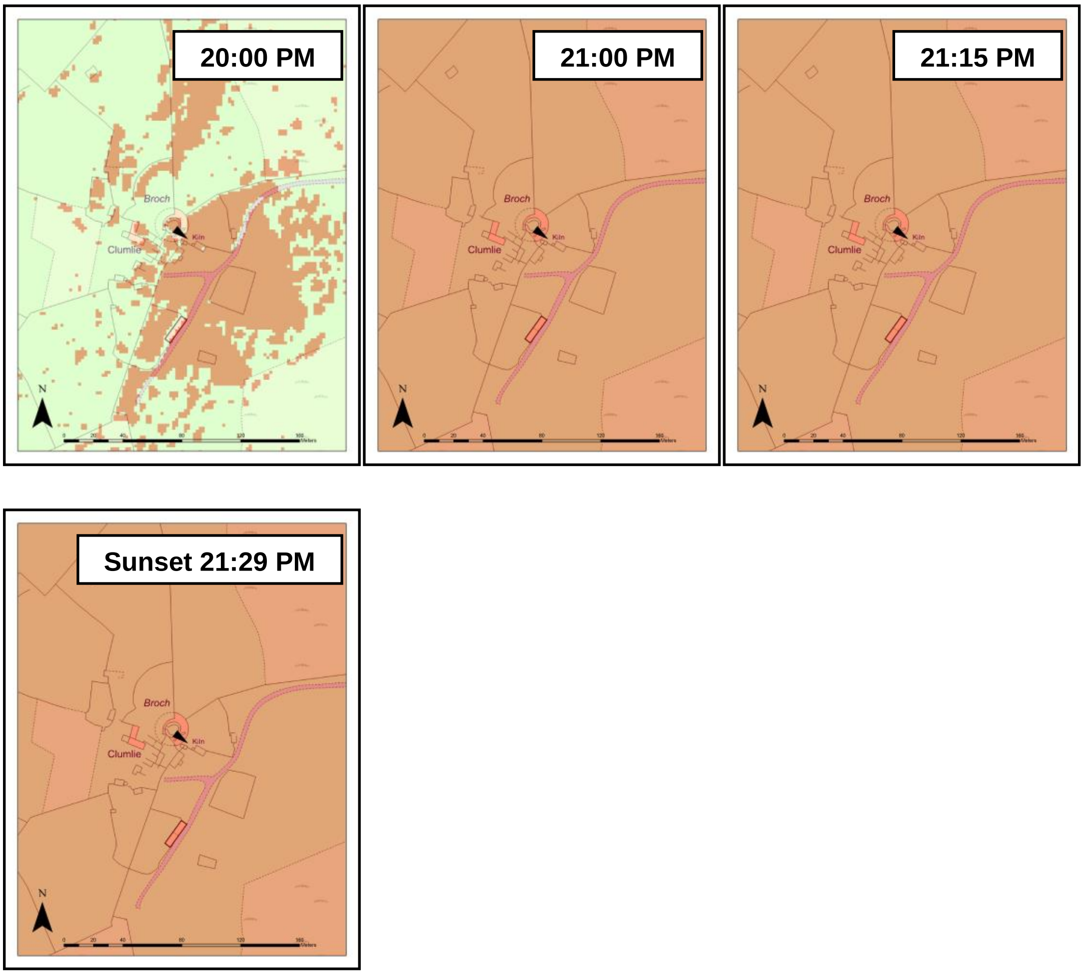


Figure 5.97. 20:00 PM to Sunset (21:29 PM) around Clumlie on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 10: Burga Water (1)

Canmore ID: 1204

Entrance: S

The Broch and its Landscape Context

This broch (Figures 5.98 and 5.99) occupies the whole surface of an islet in the small loch of Burga Water. Due to the higher ground which almost surrounds the loch, the site has extremely limited views (Figure 5.100), with no line-of-sight towards other brochs. It has views of the surrounding hills however, and a limited view westward. Most of the loch can be seen from the broch however, except for the north-east section. It is interesting that this site commands views of water, like many brochs, but it is a fresh water loch rather than the sea which is the object of attention here. Considering its lack of views of the land around it, like other brochs, I would suggest that the passage over water itself seems to have been significant for this site, and many other brochs, something explored further in Chapter Six.

The Winter Solstice (21st December) – Figures 5.101 and 5.102

The broch's due S entrance is rare in Shetland, as it is across the rest of Scotland (Crowther 2011). With regards to functionality, a due S entrance would only suit the midwinter period, because, for direct light, the sun has to be low in the sky, which is why, I believe, an entrance towards either the SW or SE is preferred, because the afternoon sun is lower than it is when it is due south. Only during midwinter would the sun be low enough in the sky to directly illuminate a south facing broch; probably between the hours of 11:00 AM and 13:00 PM.

Burga Water is interesting as the broch loses much of the morning and afternoon sun in winter. Between sunrise and 10:00-11:00 AM, the broch remains in shadow due to the eastern hills, and then gains direct light for the noon period. Then, at 13:00 PM, nearly two hours before sunset, the broch falls into the shade again and remains in shadow for the remainder of the day. Its southern entrance is therefore ideal, as a SE or SW entrance would have gained very little direct sunlight in winter.

The Equinox (21st March) – Figures 5.103 and 5.104

Unlike in winter, the structure gains direct light on its eastern side within the first half hour. It retains light for the remainder of the day, until just after 18:00 PM, when the site and the surrounding loch fall into shadow, less than half an hour before sunset. For this time of year, an entrance either towards the E, SE, W, and SW would all have been ideal. Furthermore, as the sun is higher in the spring and autumn than in the winter, the due S entrance would probably have gained little direct (but a lot of ambient) light.

The Summer Solstice (21st June) Figures 5.105, 5.106 and 5.107

The site would have gained sunlight about half an hour after sunrise during midsummer. By 04:00 AM, the broch and the surrounding landscape would have been in direct sunlight, and would have remained in it for the rest of the day. The broch would not have lost light until just before 21:00 PM, about forty minutes before sunset. Again, an entrance towards the E or W would have been best for this time of year.

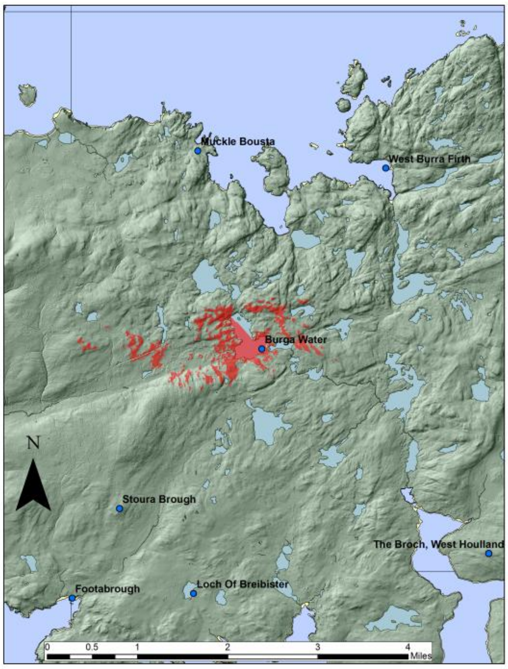
Conclusion

The broch's southern entrance would have maximised light during the winter months when the site retains very little direct sunlight, except during the noon period. Throughout the rest of the year, the broch receives ample amounts of direct sunlight throughout the day, though its southern entrance would not have benefitted as much due to the higher position of sun outside of winter, and especially during the summer. This begs the question as to why a site which receives so little direct light in winter was selected, though it may hint at seasonal usage. The lack of light for this site during winter, especially when considering that better lit areas could have been selected on the shoreline of the loch, implies that the difficult location of this site, within the loch, was of utmost importance, overriding concerns related to shelter and light.

Figure 5.98. View towards Burga Water (1).
Author’s Photo, from the south-west.

Figure 5.99. Wide view towards Burga Water (1).
Author’s Photo, from the south-west.

Figure 5.100. Multiple Viewsheds of Burga Water (1).



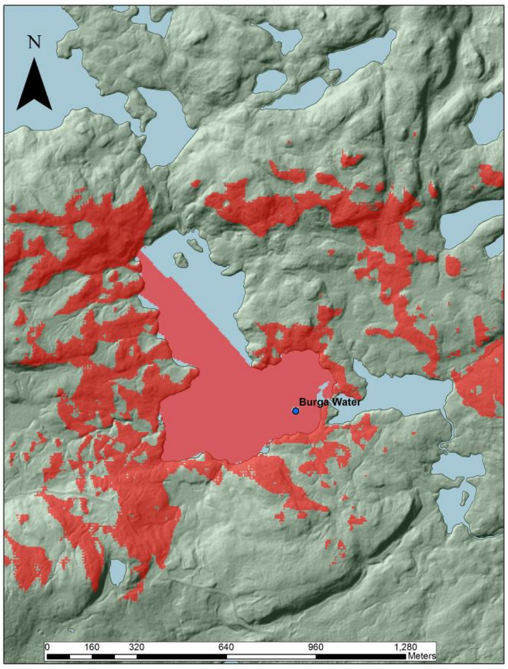


Figure 5.101. Sunrise (09:12:40 AM) to 14:00 PM around Burga Water (1) on the Winter Solstice (21st December). Red areas denote areas of shadow.

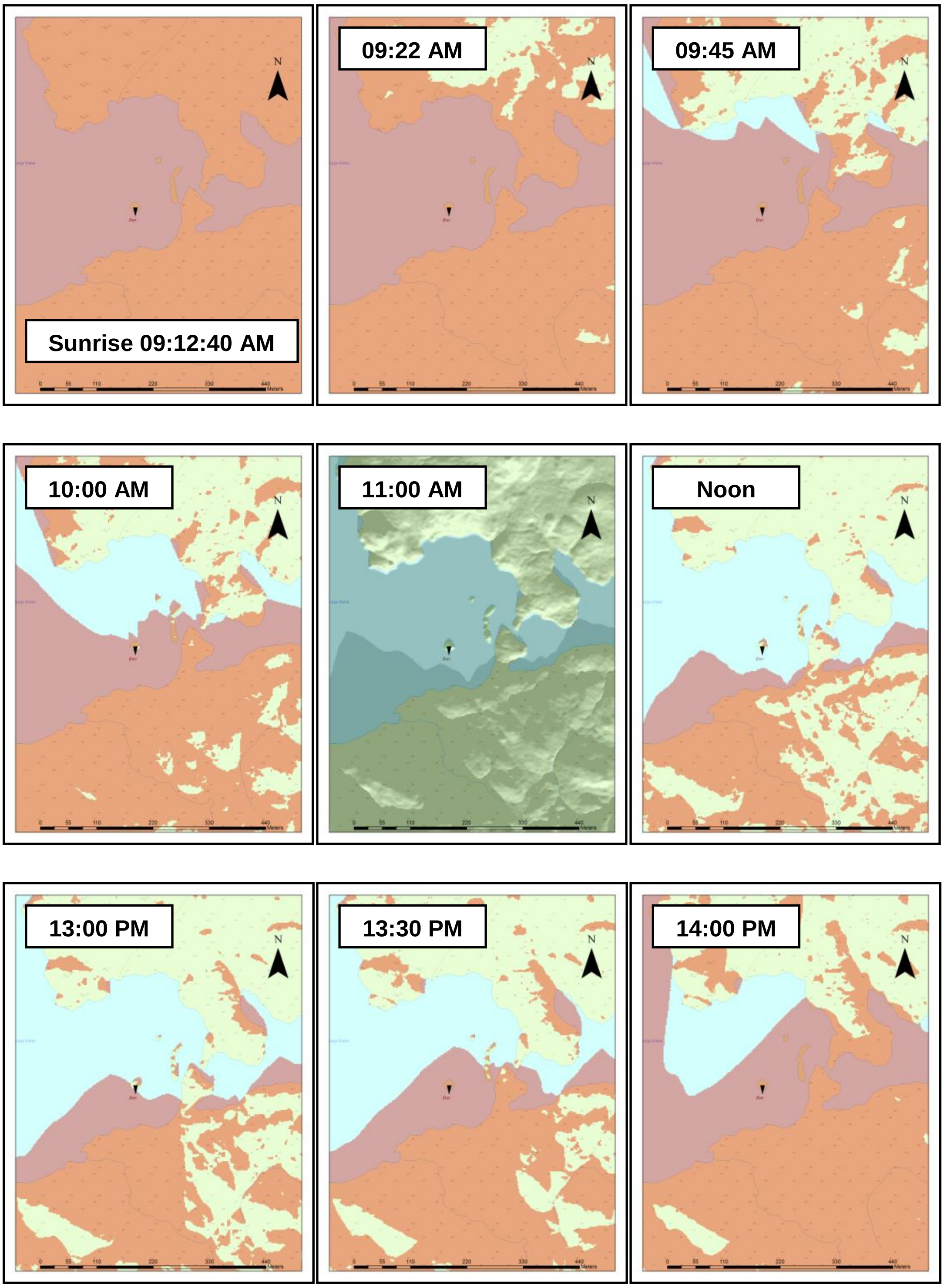


Figure 5.102. 14:15 PM to Sunset (14:53:10 PM) around Burga Water (1) on the Winter Solstice (21st December). Red areas denote areas of shadow.

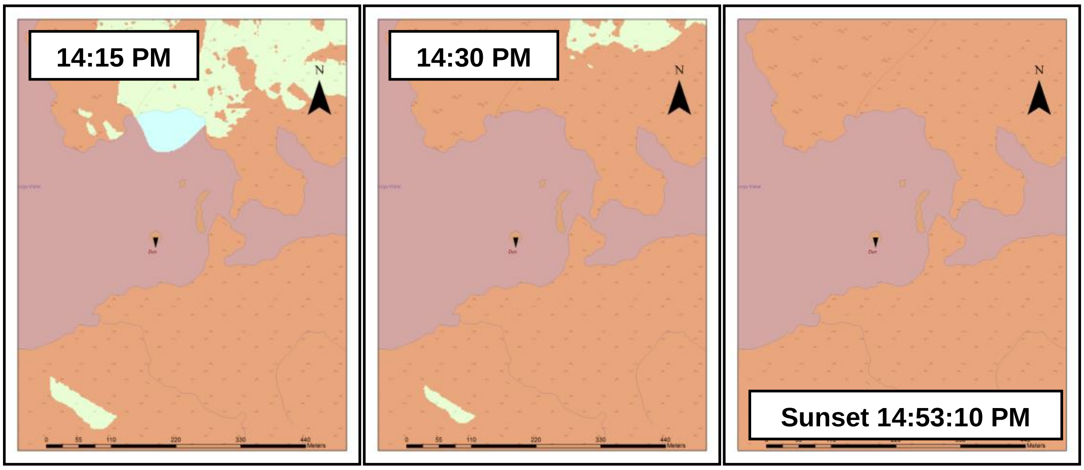


Figure 5.103. Sunrise (06:04:45 AM) to Noon around Burga Water (1) on the Spring Equinox (21st March). Red areas denote areas of shadow.

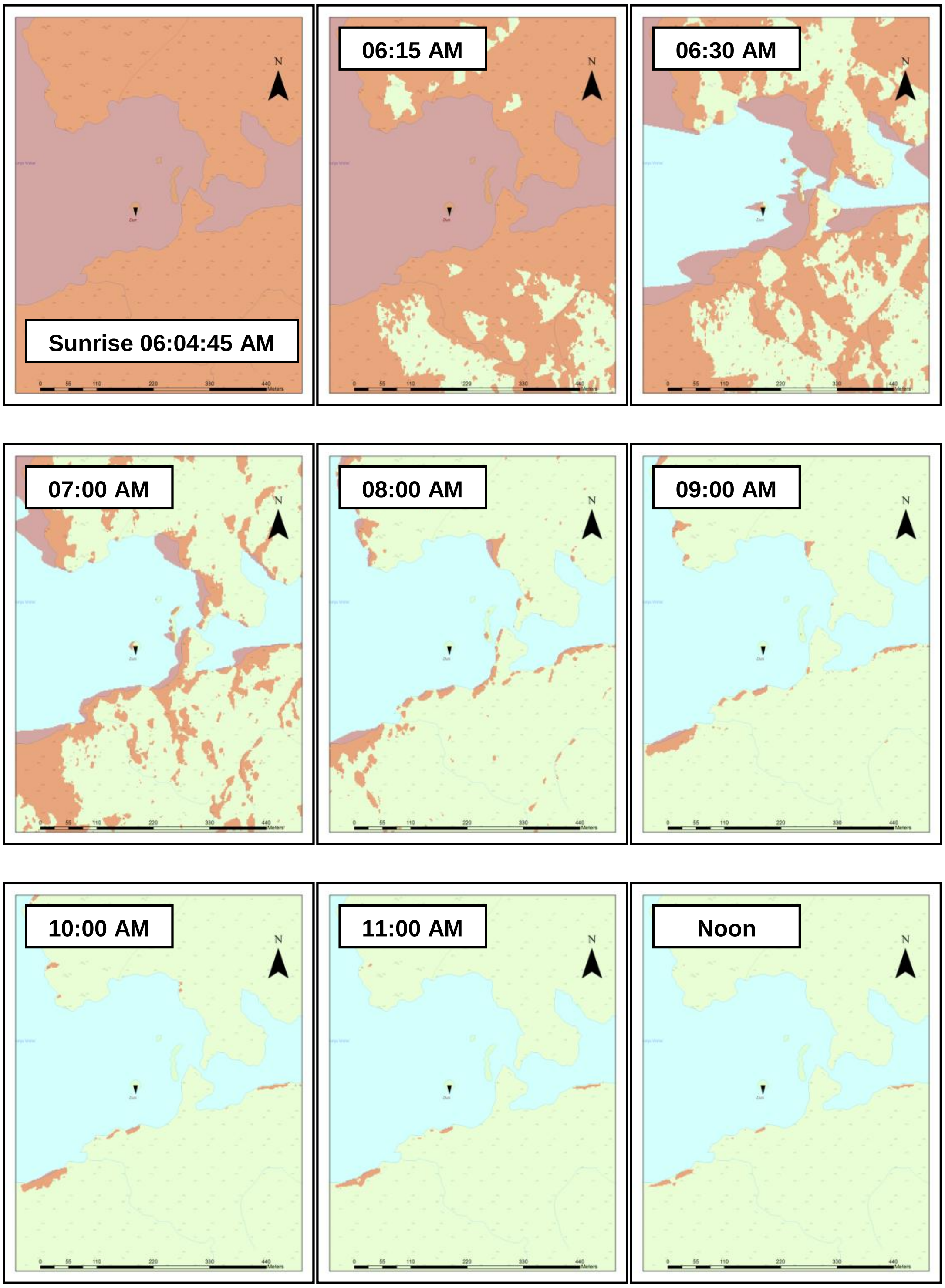


Figure 5.104.13:00 PM to Sunset (18:19:55 PM) around Burga Water (1) on the Spring Equinox (21st March). Red areas denote areas of shadow.

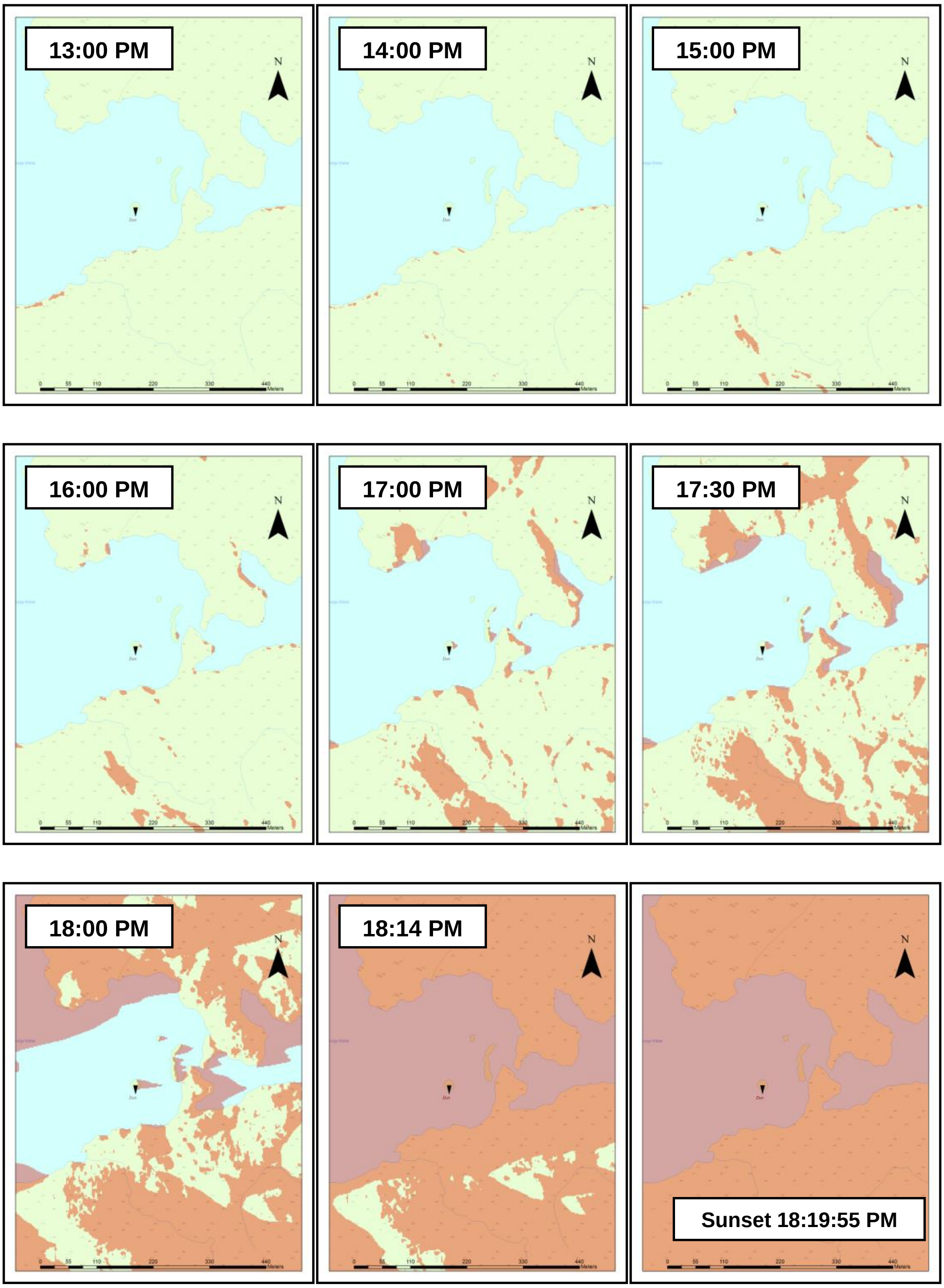


Figure 5.105. Sunrise (02:41:20 AM) to 09:00 AM around Burga Water (1) on the Summer Solstice (21st June). Red areas denote areas of shadow.

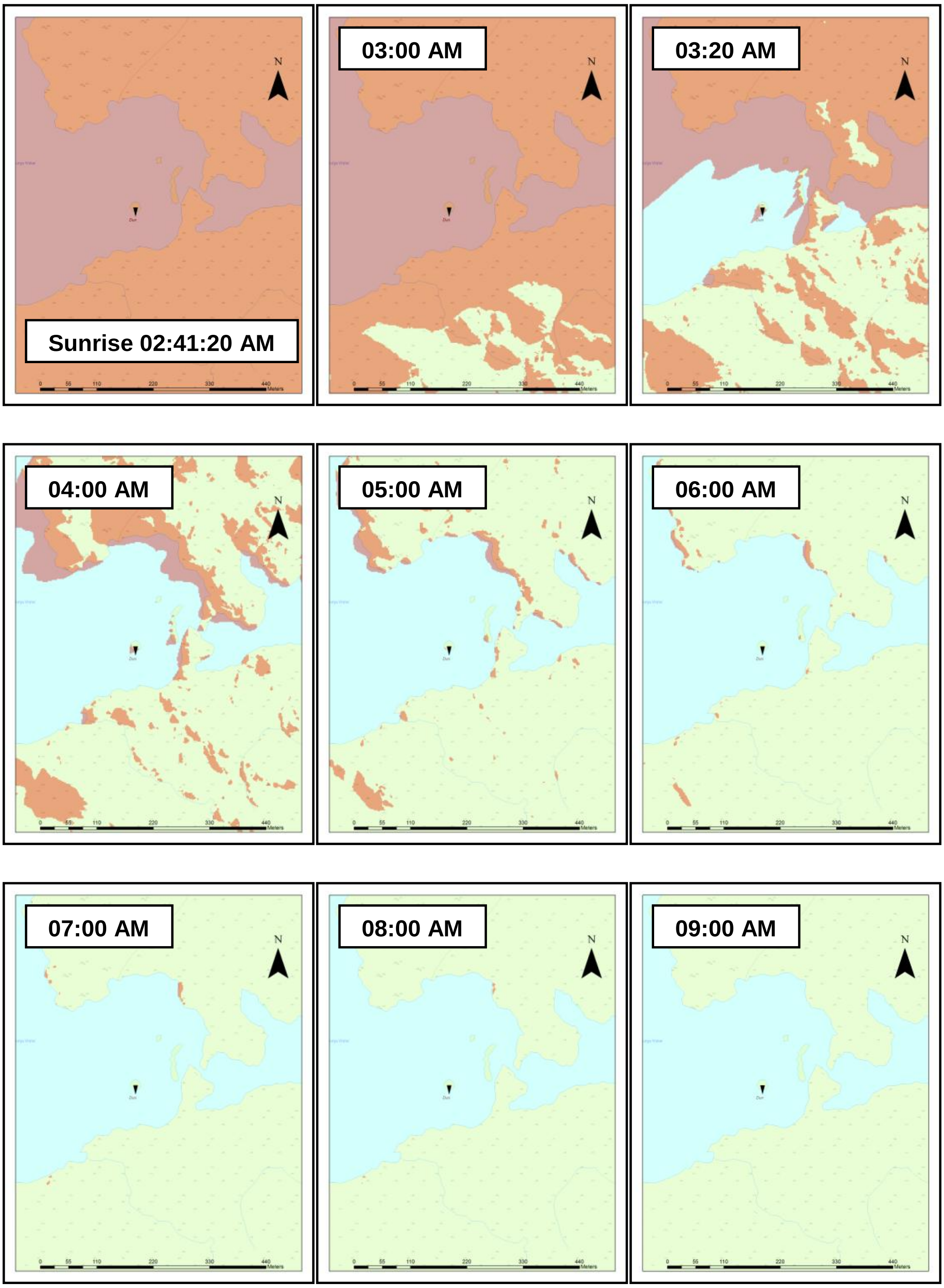


Figure 5.106. 10:00 PM to 18:00 PM around Burga Water (1) on the Summer Solstice (21st June). Red areas denote areas of shadow.

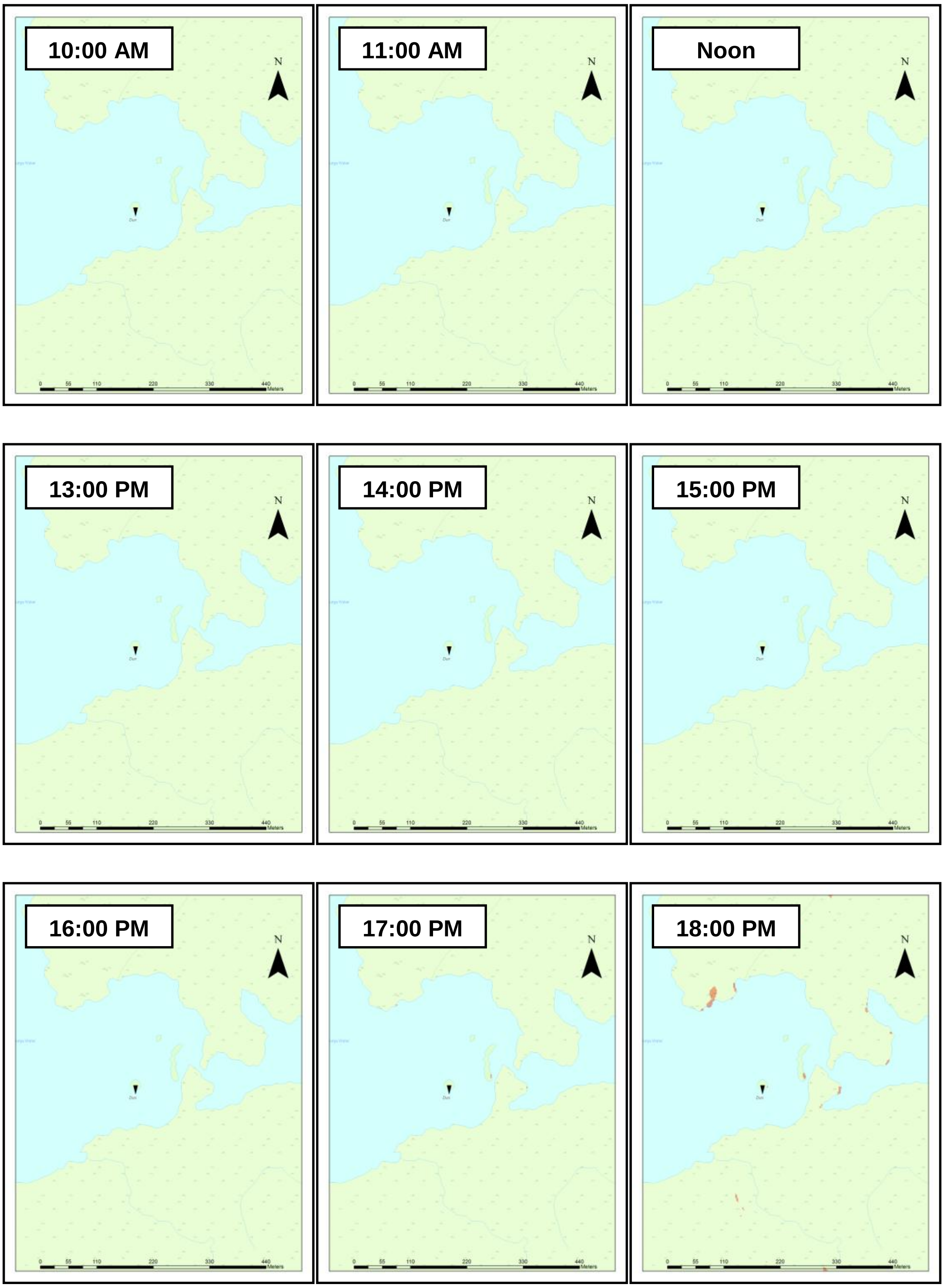
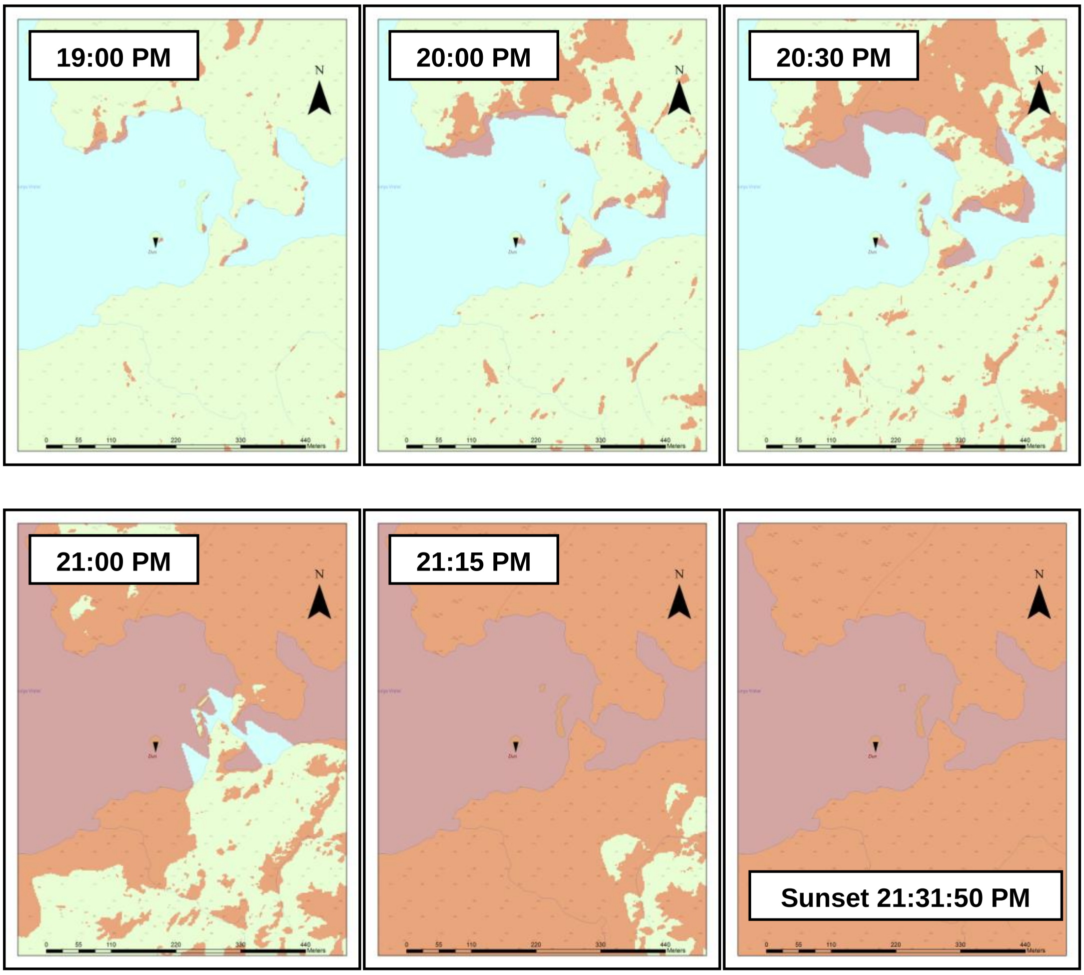


Figure 5.107.19:00 PM to Sunset (21:31:50 PM) around Burga Water (1) on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 11: Burraland Broch

Canmore ID: 948

Entrance: SW

The Broch and its Landscape Context

This unexcavated broch (Figures 5.108, 5.109, 5.110, 5.111, 5.112 and 5.113) is located on the inner end of a high rocky promontory in Dunrossness; standing on the shore opposite Mousa and in a position of considerable natural strength. As at Mousa, Burraland has excellent views of the coast to the east and south, especially to the entrance to Mousa Sound itself (Figure 5.114). However, like Mousa, it also has limited views of the landscape to the west, north and south. Along with Mousa, Burraland would have dominated Mousa Sound, and its high position on the overlooking cliffs would have emphasised this status for any seagoing vessel going along it.

The Winter Solstice – Figures 5.115 and 5.116

At sunrise, the E/SE side of Burraland broch is immediately struck by direct sunlight, and ten minutes later, this extends to the southern side of the broch. Indeed, by 10:00 AM, much of the south-eastern area around Burraland receives direct light. Light remains around the site for almost all of the remaining hours of the day. As the sun begins to set, around 14:00 PM, the shadows of the western hills reach the land peripheral to the broch; however, its position atop a rocky knoll means that the entrance can receive direct sunlight until at least 14:30 PM, finally falling into shade at sunset, at around 14:45 PM.

The fact that this position receives direct light while the rest of the landscape falls into shadow suggests that, like Mousa, this site was selected as it retains as much light as possible during midwinter especially. However, the SE side of Burraland receives noticeably more light than the SW entrance.

The Equinox (21st March) – Figures 5.117 and 5.118

At sunrise, the broch is in the shade, but by 06:15 AM, the SE side of the structure is illuminated. The site remains unobstructed until between 17:30 PM and 18:00 PM, when it falls in shadow; making it a total of around nine hours of direct sunlight. Again, an orientation towards the SE would have been better.

The Summer Solstice (21st June) Figures 5.119, 5.120 and 5.121

At sunrise, just before 03:00 AM, the north-eastern section of the broch receives minimal sunlight, and by 04:00 AM, the sun rises just enough to light a small section of the eastern side of Burraland. By 05:00 AM, the south-eastern side is lit, and by 07:00 AM, much of the broch receives light, between the NNW-E-SSW. The site retains light until around 20:30 PM, a total of twelve and a half hours, before the sun sets over the north-western hills, nearly an hour later. Again, a SE/E entrance would have been better suited to the located.

Conclusion

It would seem that any orientation between the SE-S-SW would have been sufficient for Burraland broch. Though the E and W are sometimes obstructed, the SE and SW are unhindered for the majority of the year, and both receive similar amounts of light. However, the SW entrance would have lost slightly more light than a SE facing doorway, and this may have been chosen so as to avoid the winds that came off the sea here.

Figure 5.108. Burraland Broch, with its blockhouse in the foreground. Author's Photo, from the west.

Figure 5.109. View towards the south-west from the entrance of Burraland. Author's Photo.

Figure 5.110. View towards the ENE from Burraland, with Mousa Broch in the distance. Author's Photo.

Figure 5.111. View towards the north from Burraland, down Mousa Sound. Author's Photo.

Figure 5.112. Inland view towards the north-west from Burraland, Author's Photo.

Figure 5.113. Ground Plan of Burraland Broch. (After RCAHMS 1946)

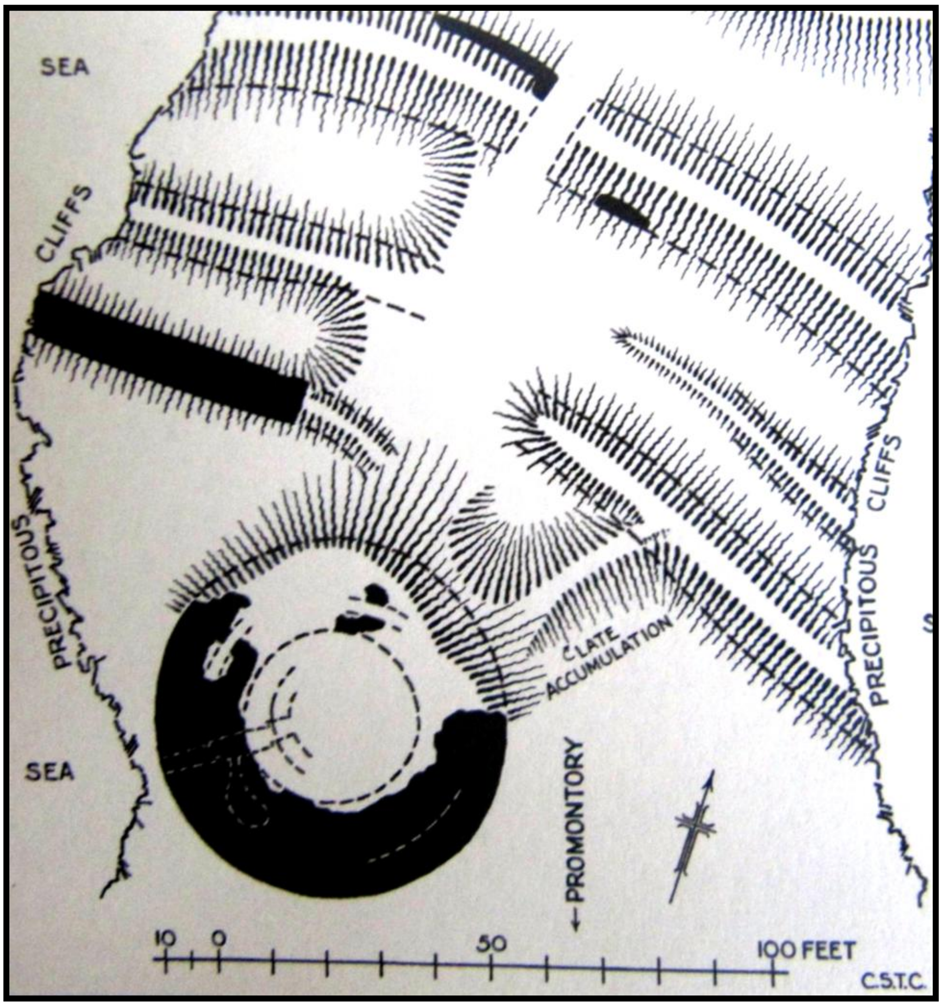


Figure 5.114. Multiple Viewsheds of Burraland Broch.

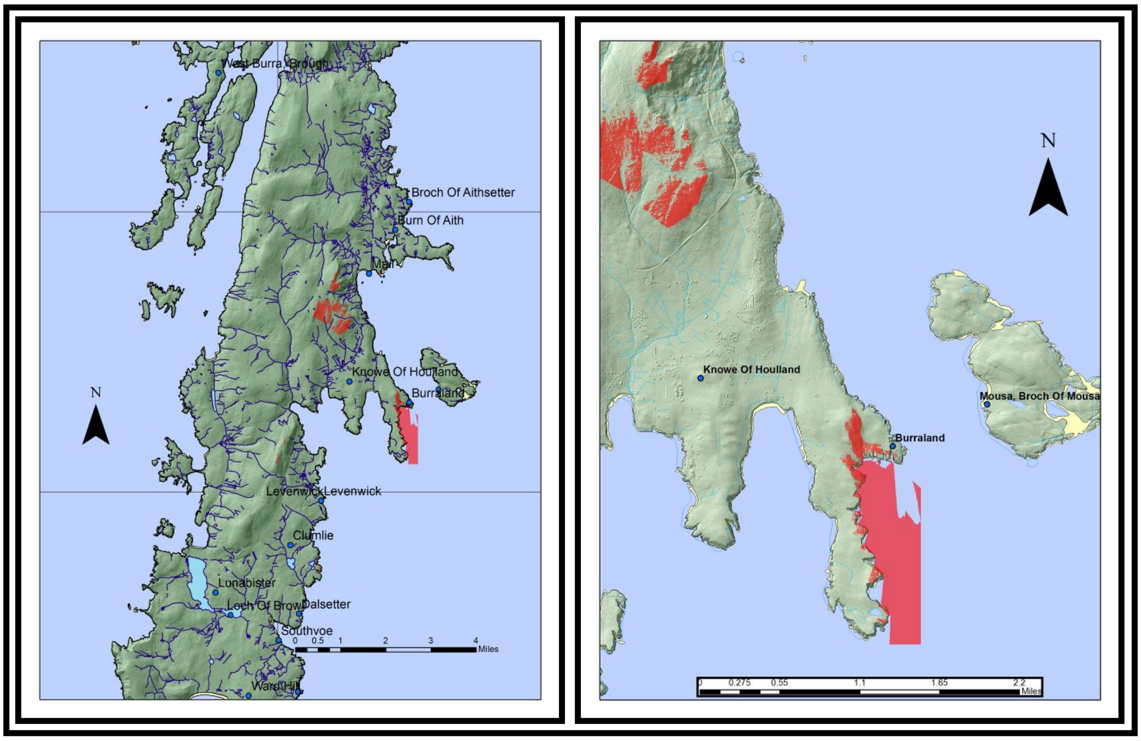


Figure 5.115. Sunrise (09:00 AM) to 14:30 PM around Burraland Broch on the Winter Solstice (21st December). Red areas denote areas of shadow.

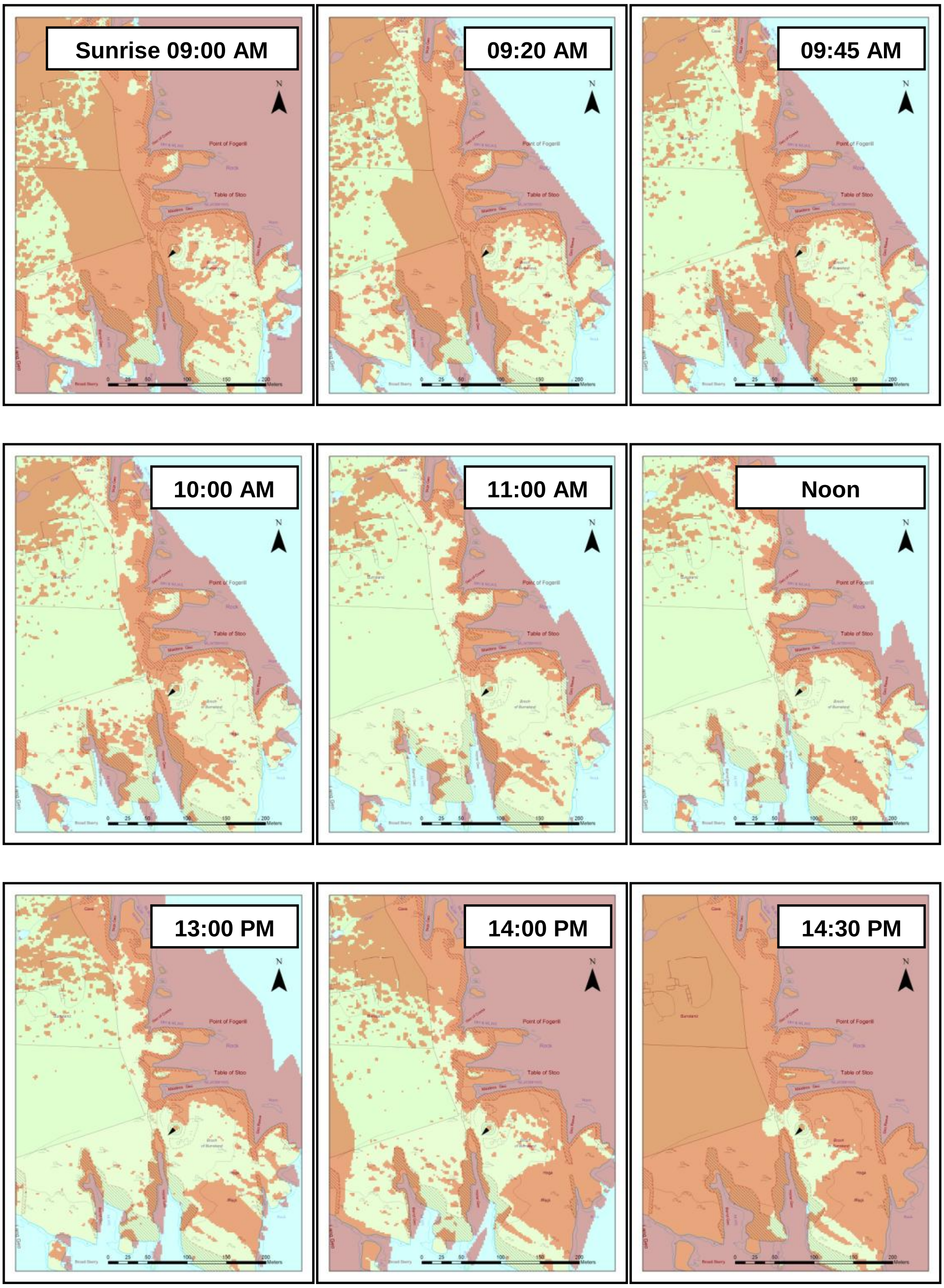
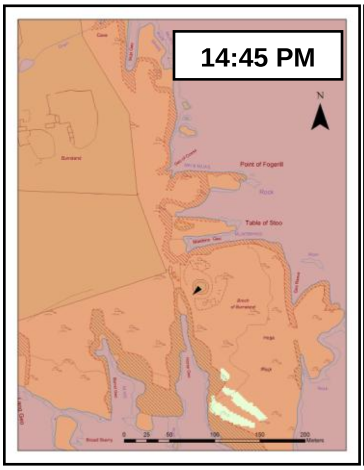


Figure 5.116. 14:45 PM to Sunset (14:55:45 PM) around Burraland Broch on the Winter Solstice (21st December). Red areas denote areas of



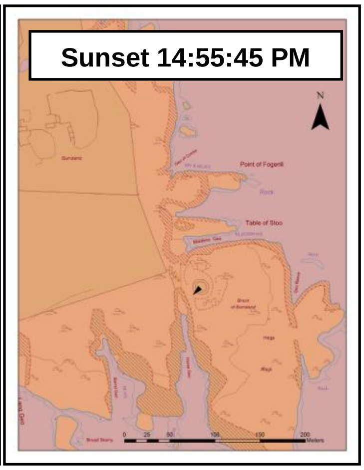


Figure 5.117. Sunrise (06:05:10 AM) to Noon around Burraland Broch on the Spring Equinox (21st March). Red areas denote areas of shadow.

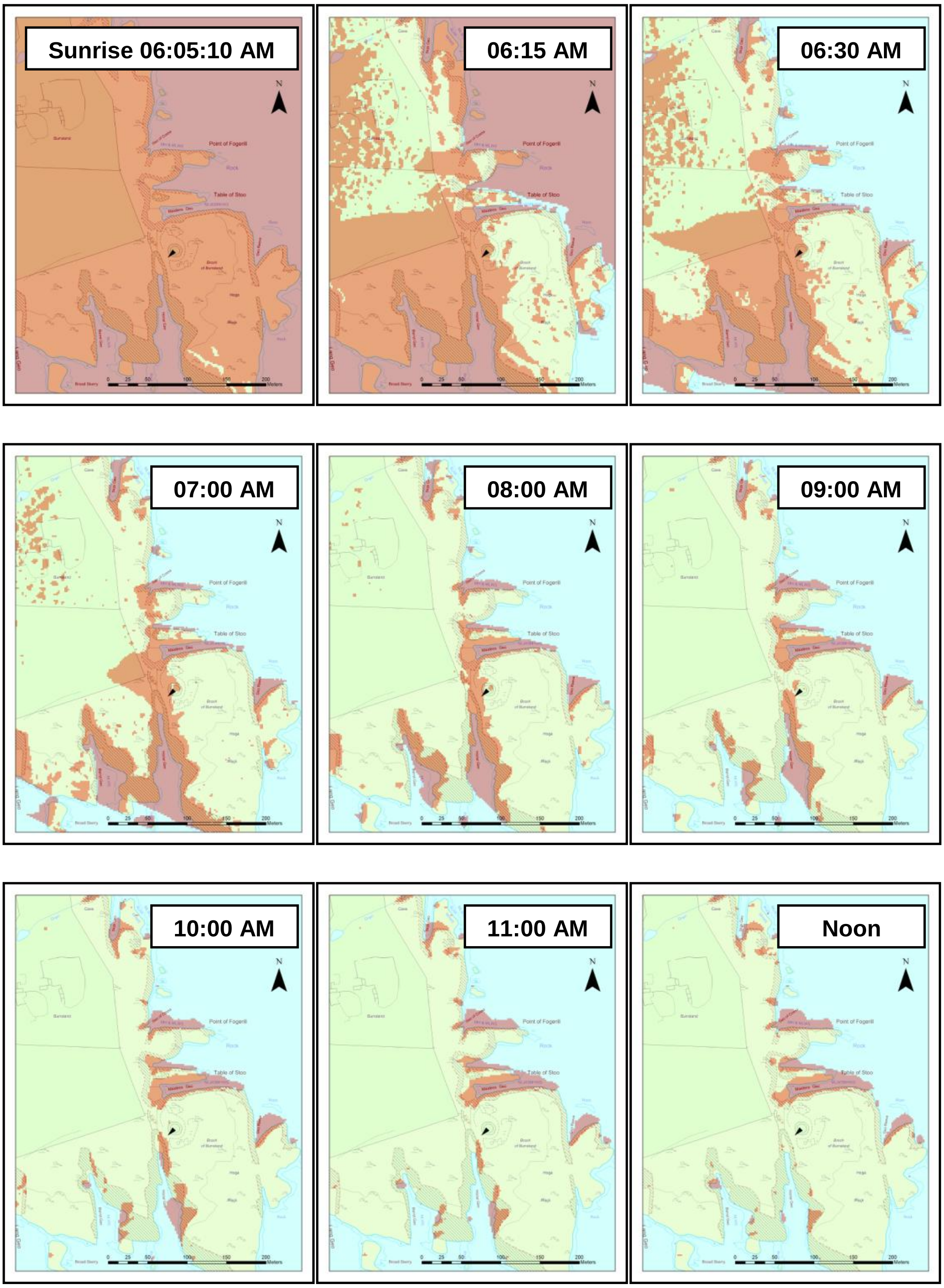


Figure 5.118. 13:00 PM to Sunset (18:10 PM) around Burraland Broch on the Spring Equinox (21st March). Red areas denote areas of shadow.

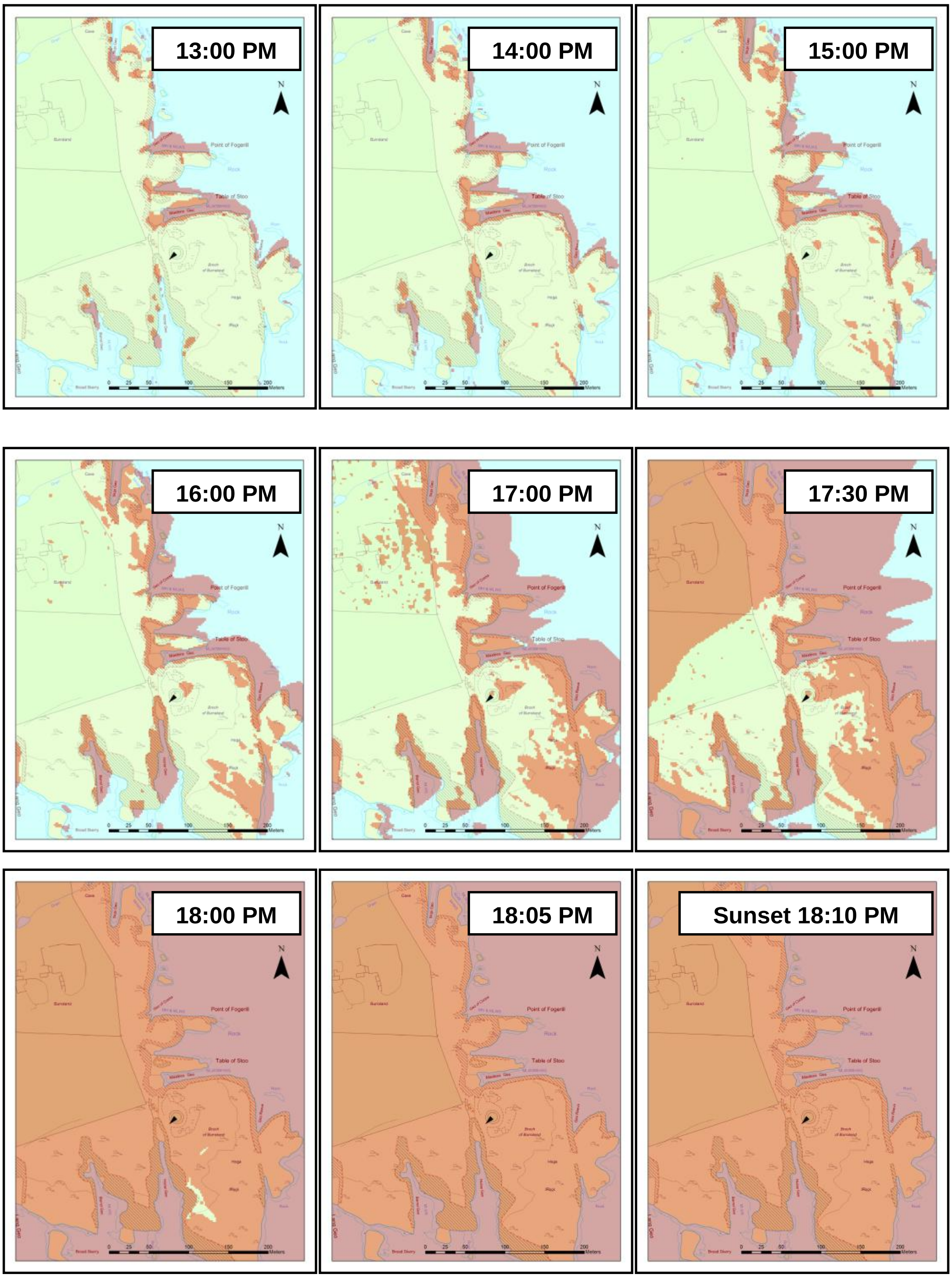


Figure 5.119. Sunrise (02:44:10 AM) to 10.00 AM around Burraland Broch on the Summer Solstice (21st June). Red areas denote areas of shadow.

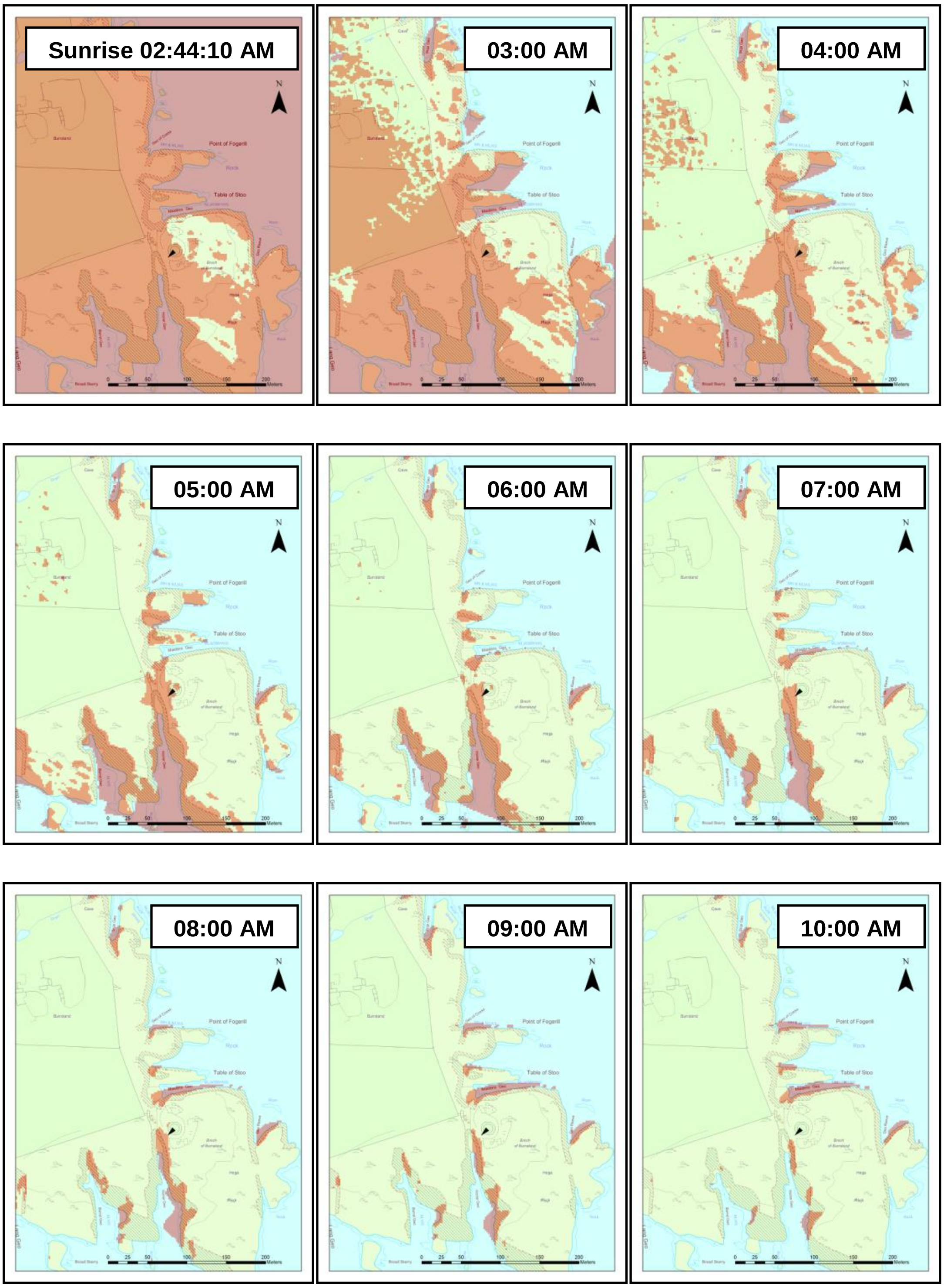


Figure 5.120. 11:00 AM to 19.00 PM around Burraland Broch on the Summer Solstice (21st June). Red areas denote areas of shadow.

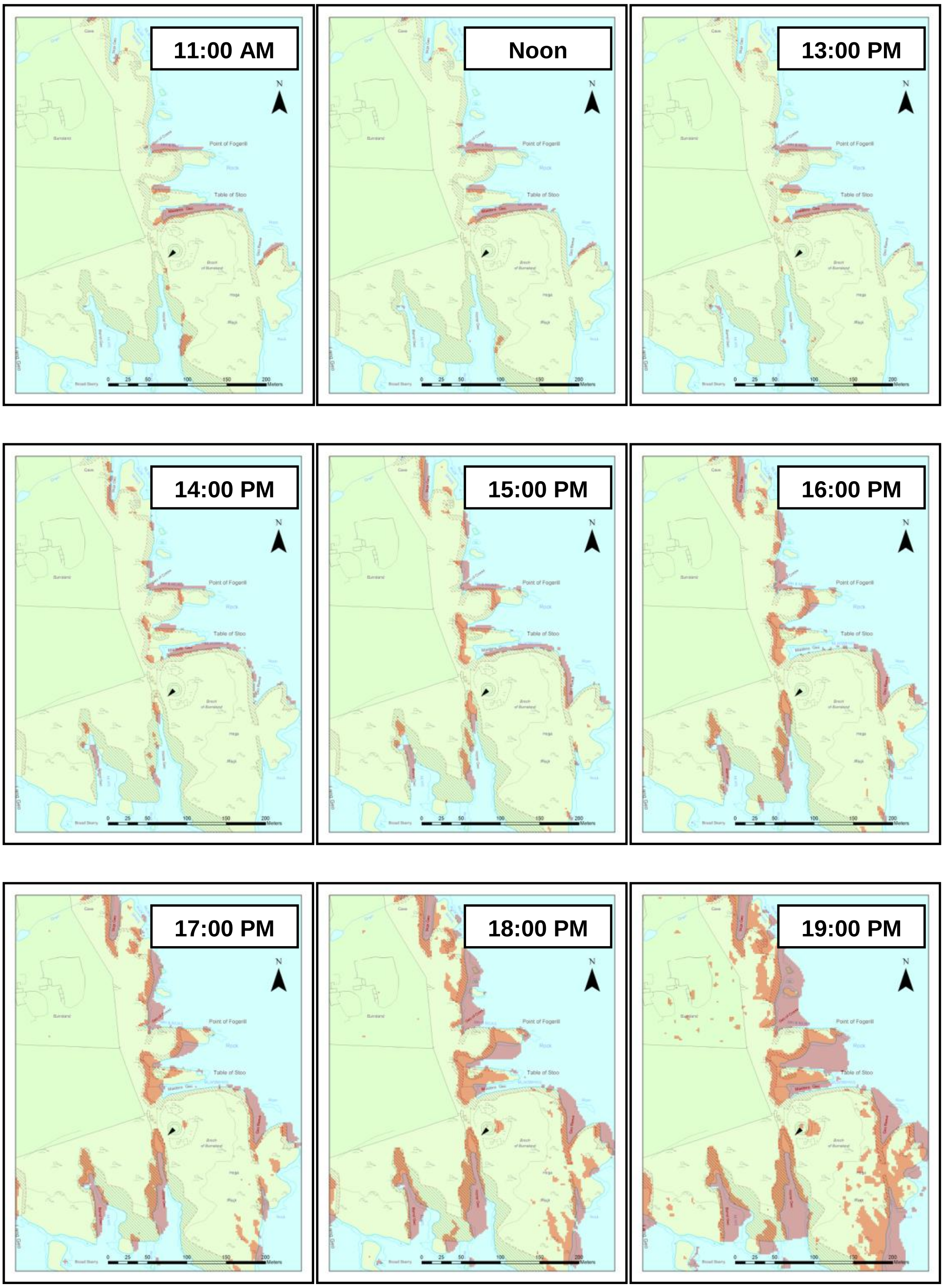
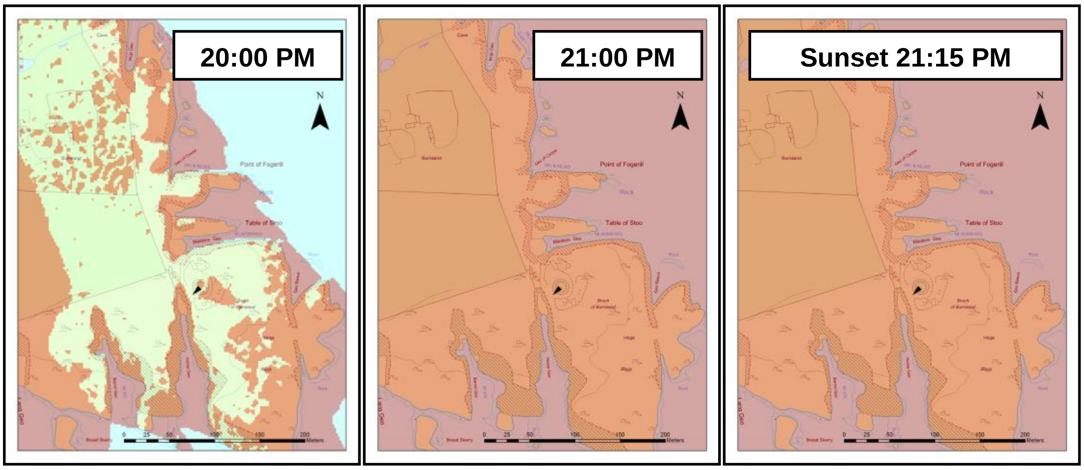


Figure 5.121. 20:00 PM to Sunset (21:15 PM) around Burraland Broch on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 12: Southvoe

Canmore ID: 916

Entrance: SW

The Broch and its Landscape Context

Southvoe broch (Figures 5.122, 5.123, 5.124 and 5.125), with its SW entrance (RCAHMS 1946: 23-24; MacKie 2002a: 81), stands near the edge of cliffs, but nevertheless has an excellent natural harbour, easily accessible from the broch, almost immediately in front of the structure. This is one reason why this spot may have been selected. As seen in Figure 5.126, it also has brilliant views out to sea, as most coastal brochs do, but with limited visibility on the landward side, as is also common. It has two views of only two other brochs, Dalsetter and Ward Hill, but possesses a commanding view of its excellent natural harbour, obviously a feature which influenced the decision to build here.

The fact that it is so close to the sea may have influenced the decision to orientate the broch towards the SW, away from the sea and the winds which come off it. However, this is still an orientation that faces the prevailing winds on the landward side, and is strange for this reason.

The Winter Solstice (21st December) – Figures 5.127 and 5.128

Due to the small hill to the south-east of the broch, the structure is not immediately illuminated as the sun rises. It is not until half an hour after sunrise that the eastern and southern section of the broch receives light. Nevertheless, this is one of the first places on this stretch of cliff that receives light. If the broch was built slightly further south for instance, it would have received sunlight later, between 10:00 AM and 11:00 AM.

By noon, the site and the area around it receive ample sunlight, and the south-eastern entrance becomes fully illuminated. However, by 14:00 PM, shadows encroach early on the site, though the entrance and the area around it would just have been lit. Between 14:00 PM and 14:30 PM, the site falls into shade, half an hour before sunset.

All in all, a southern doorway would, of course, receive more light, but it should be remembered that the southern sun is always highest in the sky and so it seldom illuminates the interior directly. Interestingly, for the winter, the SW entrance receives slightly less light than a SE doorway would have.

The Equinox (21st March) – Figures 5.129 and 5.130

Unlike in winter, the eastern side of the broch and the area around it are immediately illuminated at sunrise, and the broch and its landscape remain in light until near sunset. At 17:00 PM, much of the landscape is still in direct sunlight, and so is the SW entrance. Interestingly, by 18:00 PM, a full half-hour before sunset, the entire landscape is in the shade due to the western hills. This means that its SW entrance loses light in the spring and autumn, and so with regards to light, a SW entrance would not have been as affective as a SE entrance would have been.

The Summer Solstice (21st June) Figures 5.131, 5.132 and 5.133

At sunrise, the broch is not illuminated until around an hour afterwards. By 04:00 AM, the entire landscape is in direct sunlight, and remains so for the day. By 20:00 PM, shadow encroaches around the broch, but the entrance remains lit, but by 21:00 PM, the broch falls into the shade, and remains shadowed for the last half-hour of remaining daylight. For the summer then, a SW entrance would probably receive slightly more sunlight than a SE. However, an eastern or western entrance would certainly receive more throughout the day, as the sun is much higher in the SW/SE sky in the summer than it is in the winter.

Conclusion

With regards to light, Southvoe's SW entrance would not have been as affective as a SE entrance, especially during the spring and autumn. However, as noted, this orientation may be accounting for winds coming off the sea. The fact that the broch is located on a cliff edge would have accentuated the need for protection here. Nevertheless, a due W or E entrance would have received more light throughout the year and would have largely been protected from the winds.

Figure 5.122. Remains of Southvoe Broch.
Author's Photo, from the south.

Figure 5.123. View towards the south-west Southvoe.
Author's Photo.

Figure 5.124. View towards the north from Southvoe.
Author's Photo.

Figure 5.125. View towards the south from Southvoe.
Author's Photo.

Figure 5.126. Multiple Viewsheds of Southvoe Broch.

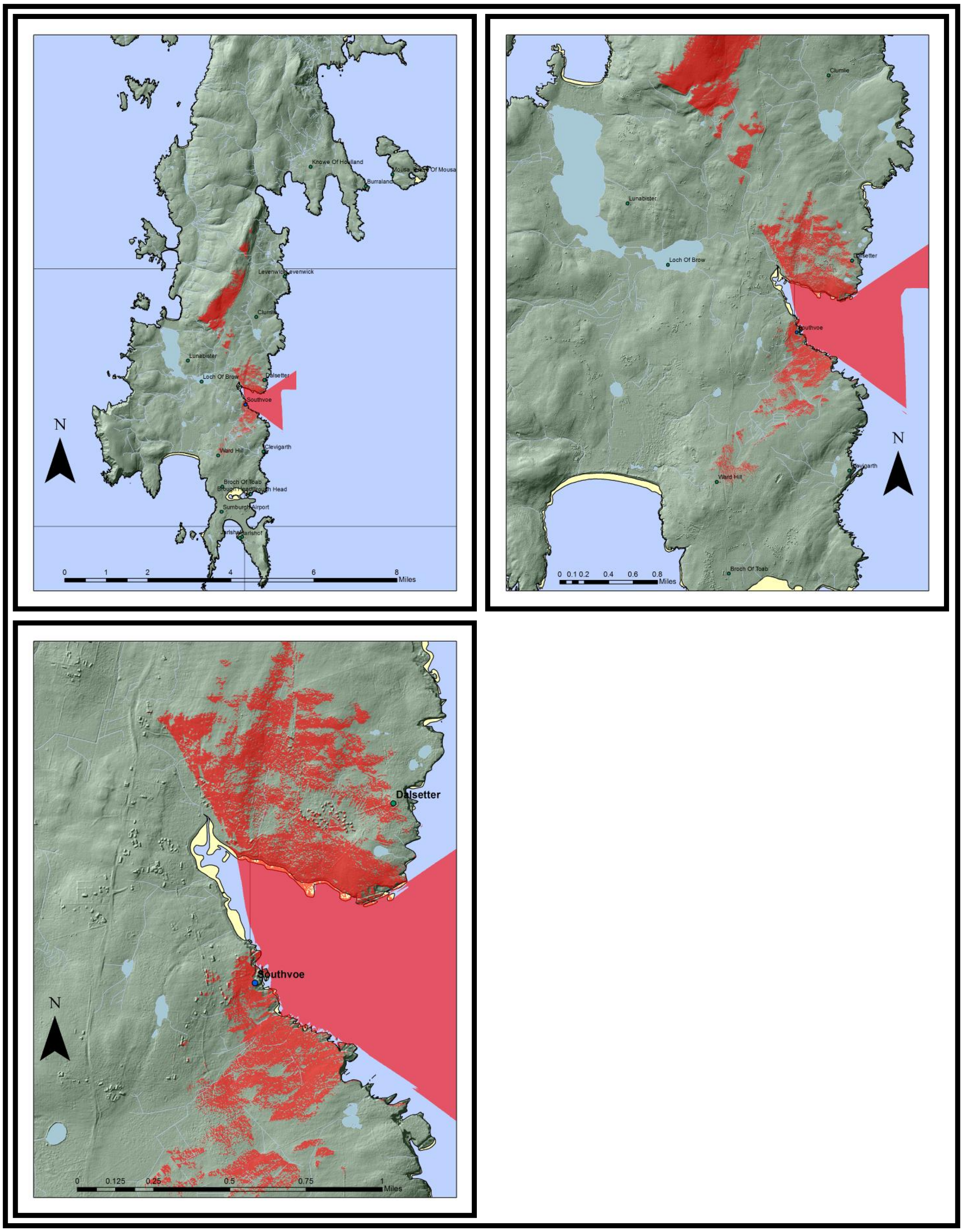


Figure 5.127. Sunrise (09:10 AM) to 14:30 PM around Southvoe on the Winter Solstice (21st December). Red areas denote areas of shadow.

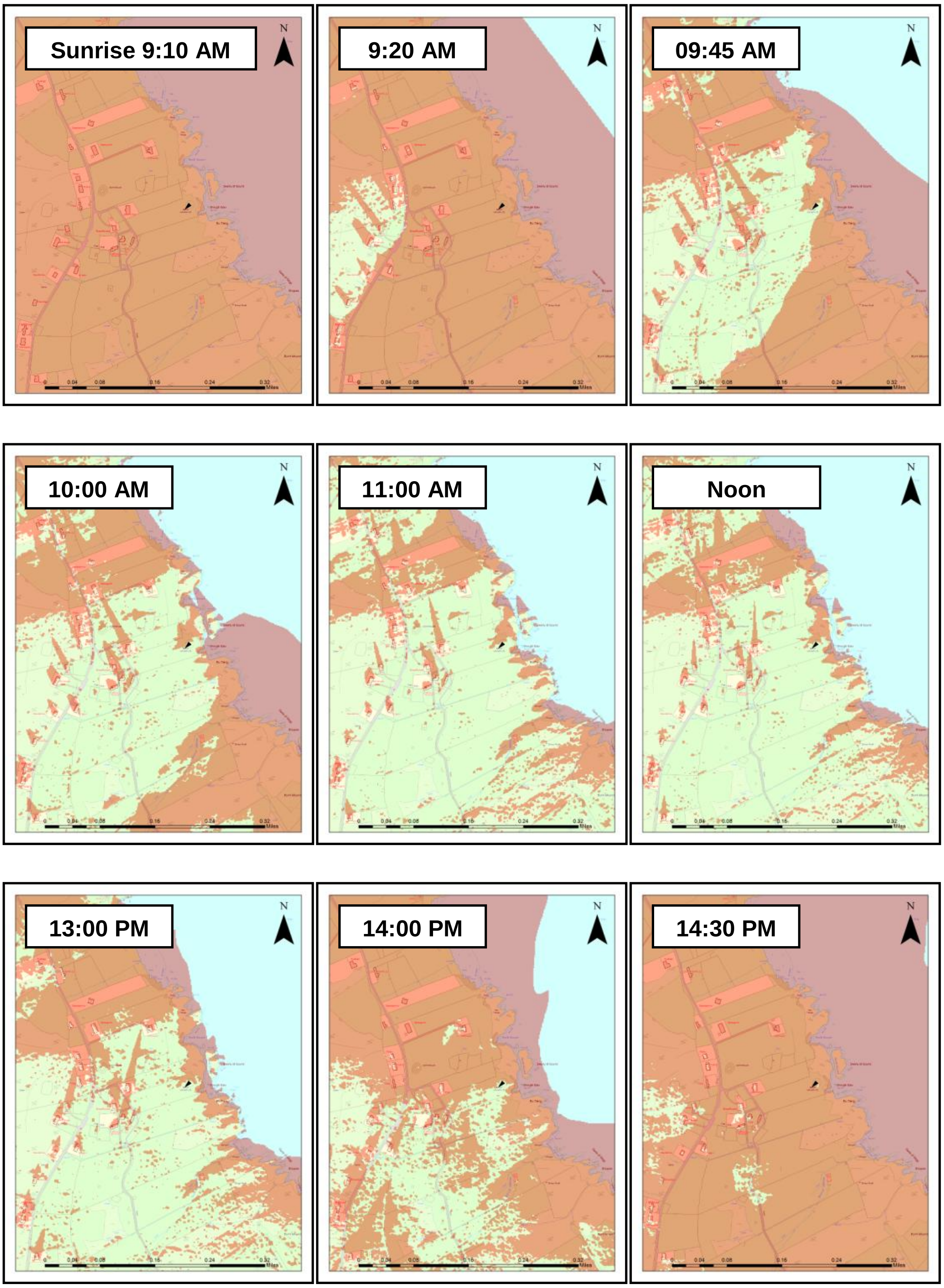
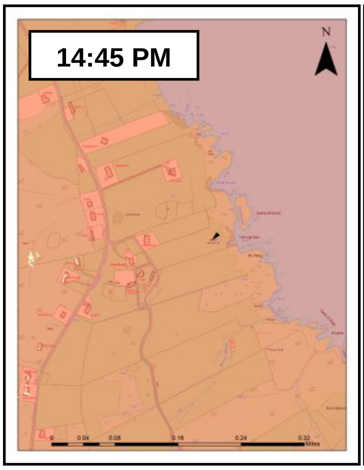


Figure 5.128. 14:45 PM to Sunset (14:55:45 PM) around Southvoe on the Winter Solstice (21st December). Red areas denote areas of shadow.



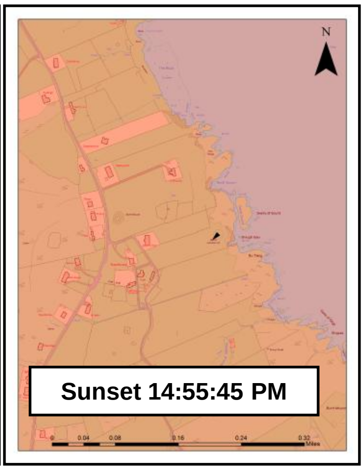


Figure 5.129. Sunrise (06:05:10 AM) to Noon around Southvoe on the Spring Equinox (21st March). Red areas denote areas of shadow.

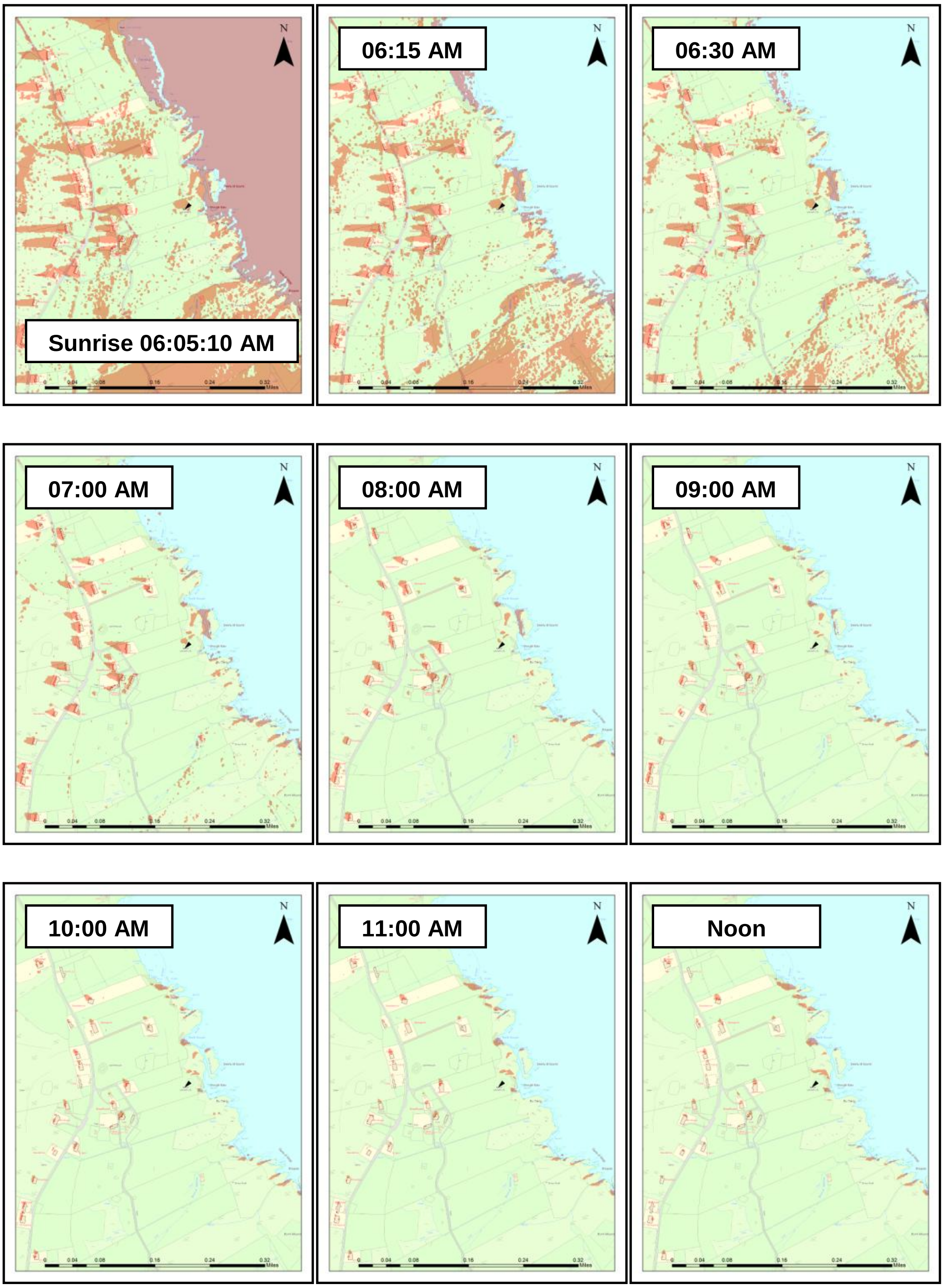


Figure 5.130. 16:00 PM to Sunset (18:19:45 PM) around Southvoe on the Spring Equinox (21st March). Red areas denote areas of shadow.

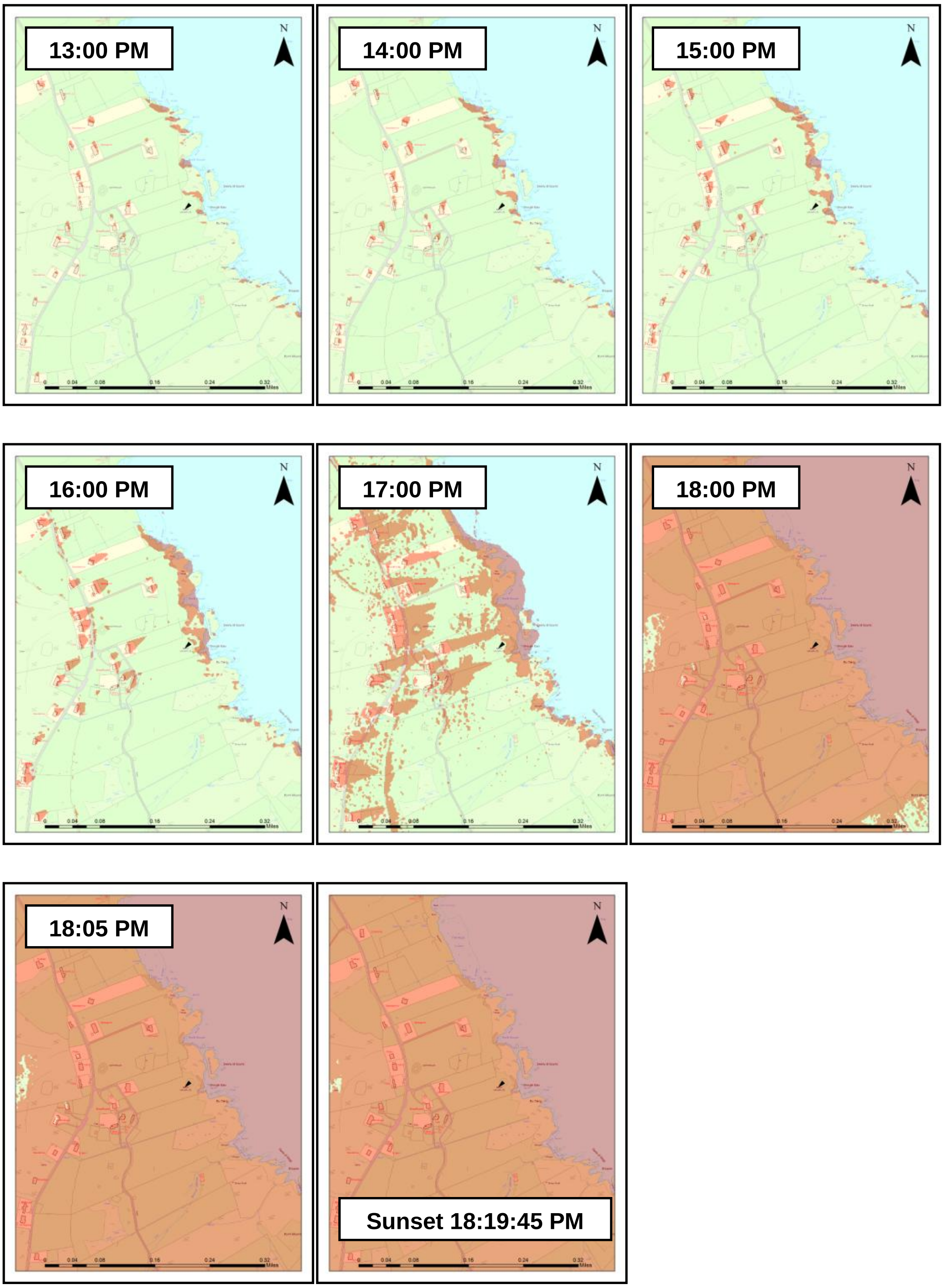


Figure 5.131. Sunrise (02:44:10 AM) to 10.00 AM around Southvoe on the Summer Solstice (21st June). Red areas denote areas of shadow.

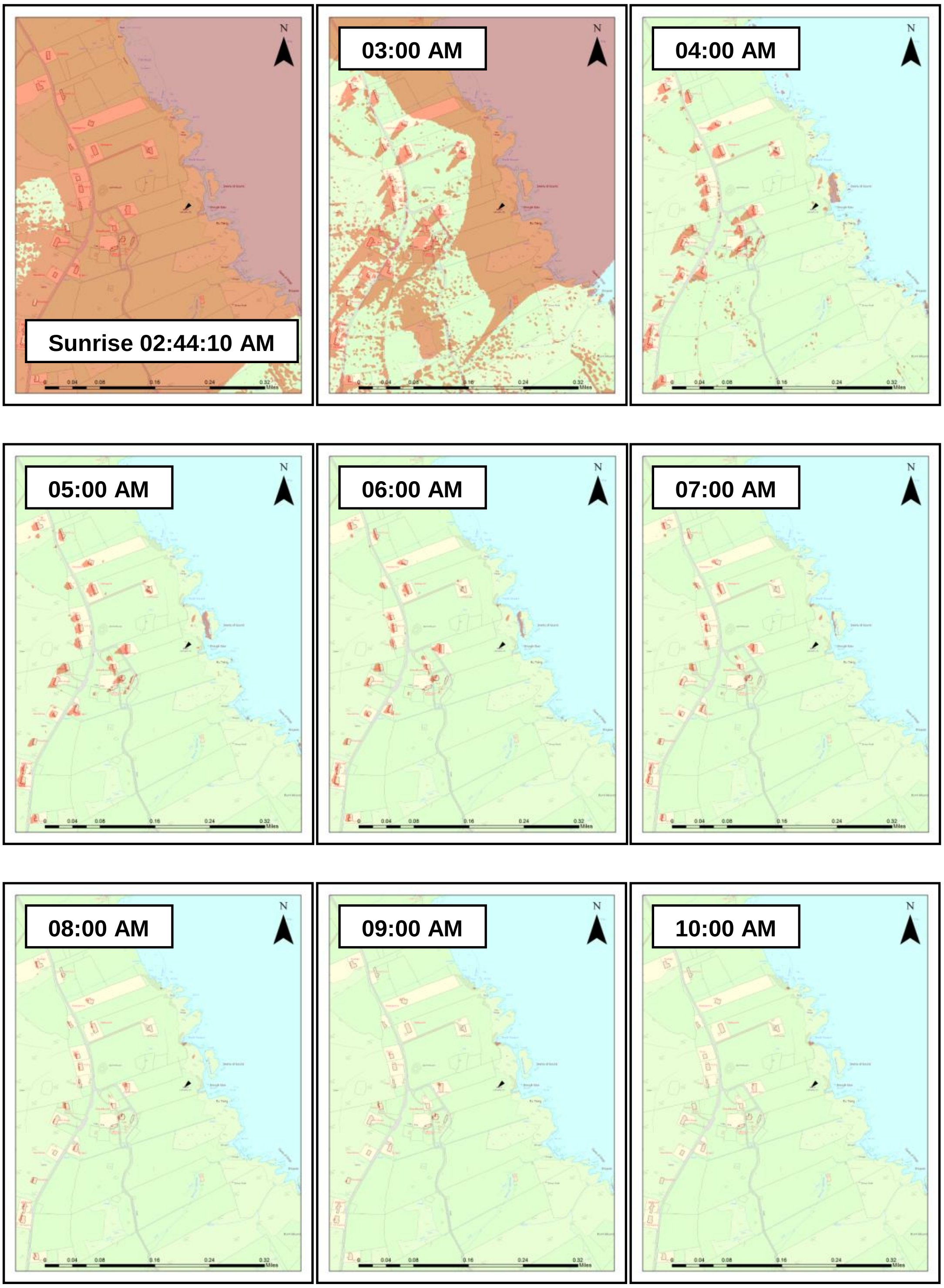


Figure 5.132. 11:00 AM to 19:00 PM around Southvoe on the Summer Solstice (21st June). Red areas denote areas of shadow.

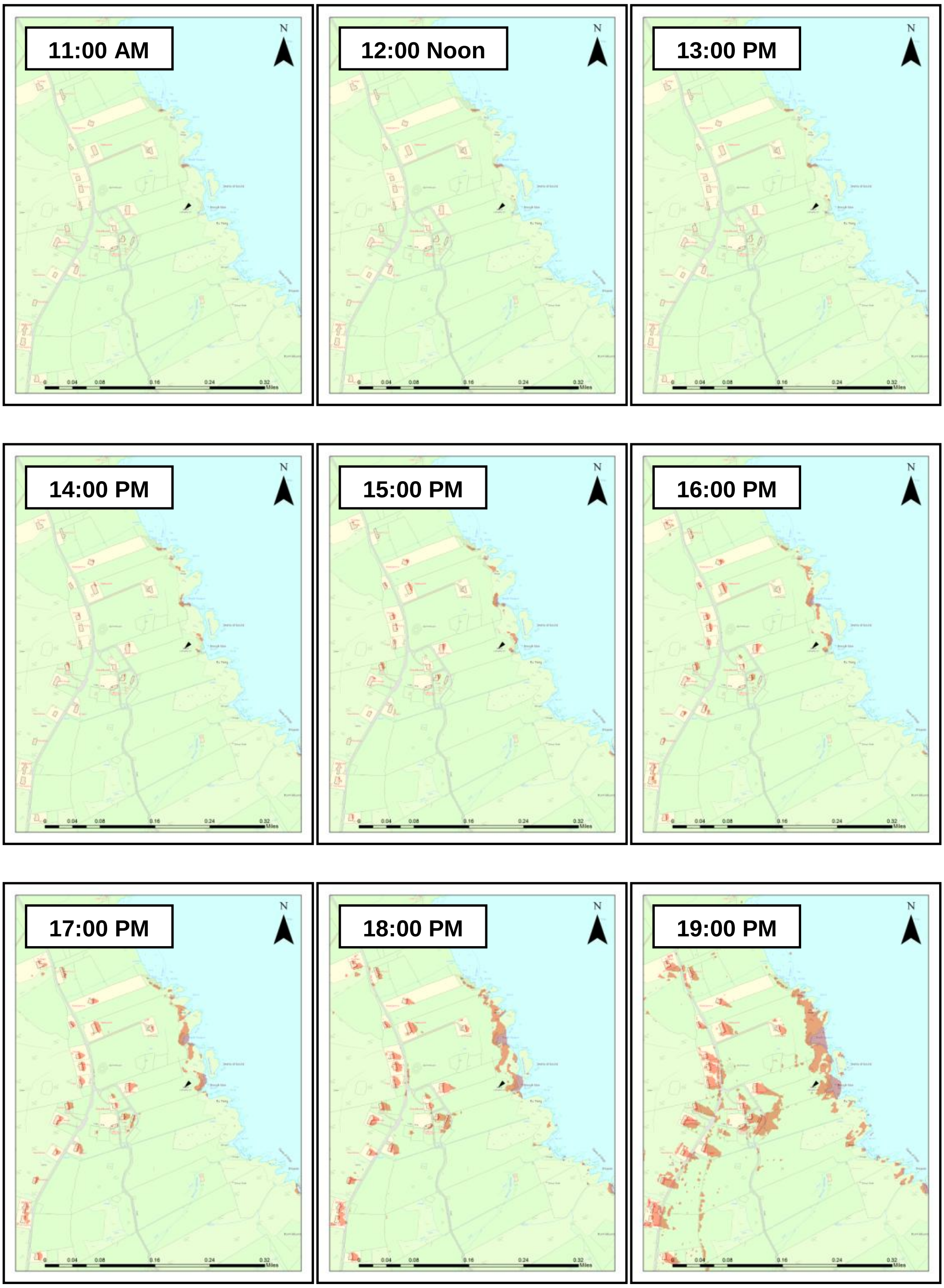
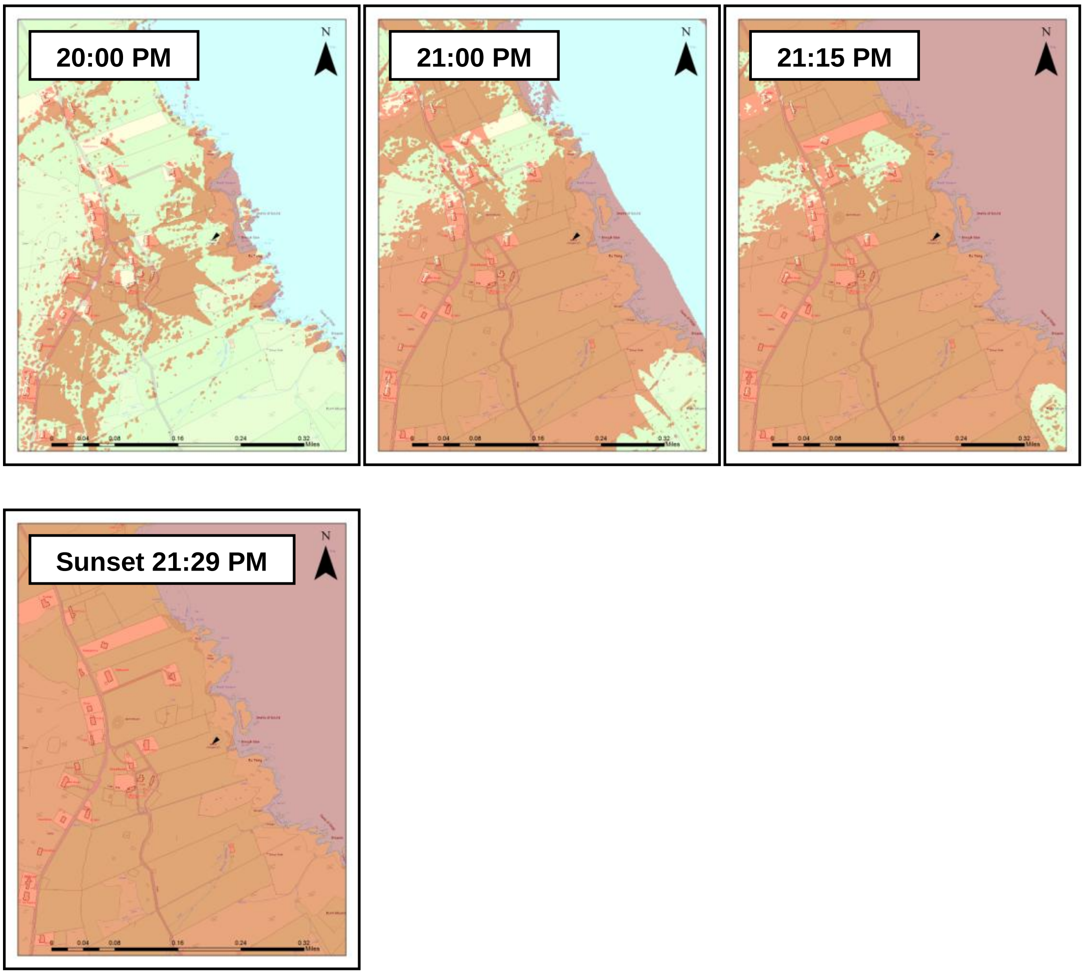


Figure 5.133. 20:00 PM to Sunset (21:29 PM) around Southvoe on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 13: Clevigarth

Canmore ID: 917

Entrance: SW

The Broch and its Landscape Context

This SW facing broch (see Figures 5.134, 5.135, 5.136, 5.137 and 5.138; for survey details, see RCAHMS 1946: 27; Dockrill, Turner and Brown 2003) sits on a high cliff-top position, and though this allows good views of the local landscape (Figure 5.139), it also provides this site with excellent views out to sea. However, there is no line-of-site to neighbouring brochs such as Boddam, Toab, Eastshore or Scatness, all less than two miles away. It does just about have a view of Mousa to the north however. Again, this suggests the sea was the focus of attention. Though it would have appeared somewhat impressive when approaching from the landward side, the view of the broch on the cliffs for passing boats would have emphasised this position further.

The Winter Solstice (21st December) – Figures 5.140 and 5.141

As the site is positioned on a cliff edge that faces SE, the eastern and south-eastern side of the broch becomes immediately illuminated at sunrise, while much of the rest of the landscape remains in shadow. It is not until around 11:00 AM that the landscape to the north of the broch receives direct sunlight. The site retains sunlight until around 14:00 PM, when shadow begins to encroach on it. Between 14:00 PM and 14:30 PM, the site loses direct sunlight altogether, at least twenty-five minutes before sunset. In this way, a SE entrance would have received more sunlight throughout the day in winter.

The Equinox (21st March) – Figures 5.142 and 5.143

In the spring and autumn, the broch's eastern side gains direct sunlight immediately as the sun rises just after 06:00 AM. By 07:00 AM, much of the surrounding landscape is in sunlight. By 18:00 PM, the site and its surrounding landscape is already in shadow due to the hills to the west of the broch, meaning that the SW entrance loses at least half an hour of direct sunlight before sunset. Again, an eastern entrance would receive more light throughout the day.

The Summer Solstice (21st June) Figures 5.144, 5.145 and 5.146

At sunrise, just before 03:00 AM, the broch's north and north-eastern side is one of the first places in the vicinity to be illuminated. By 04:00 AM, the sun becomes high enough to illuminate much of the landscape around the site. The broch thus remains in sunlight for the remainder of the day, until around 20:00 PM, when shadow encroaches on its SW entrance. Due to the hills in the west and north-west, by 21:00 PM, the site and its landscape is already in shadow, nearly half an hour before sunset.

Conclusion

With regards to light availability, a SE or E entrance would have received more light than the SW entrance. This entrance may have been selected because a view of the sea was not wished for, for whatever reason. Sitting on an extremely exposed section of a cliff edge that faces SE, it could also be that Clevigarth's SW entrance was selected over a SE entrance because the builders wished to avoid the strong winds that would have come off the sea here. However, as the SW faces the prevailing winds, this is still not an ideal selection.

Figure 5.134. Remains of Clevigarth Broch.
Author’s Photo.

Figure 5.135. View towards the south-west from Clevigarth ‘entrance’. Author’s Photo.

Figure 5.136. View towards the south-east from Clevigarth.
Author's Photo.

Figure 5.137. View towards the north-east from Clevigarth.
Author's Photo.

Figure 5.138. Ground Plan of Clevigarth Broch.
(After MacKie 2002a: 161; fig. 4.62).

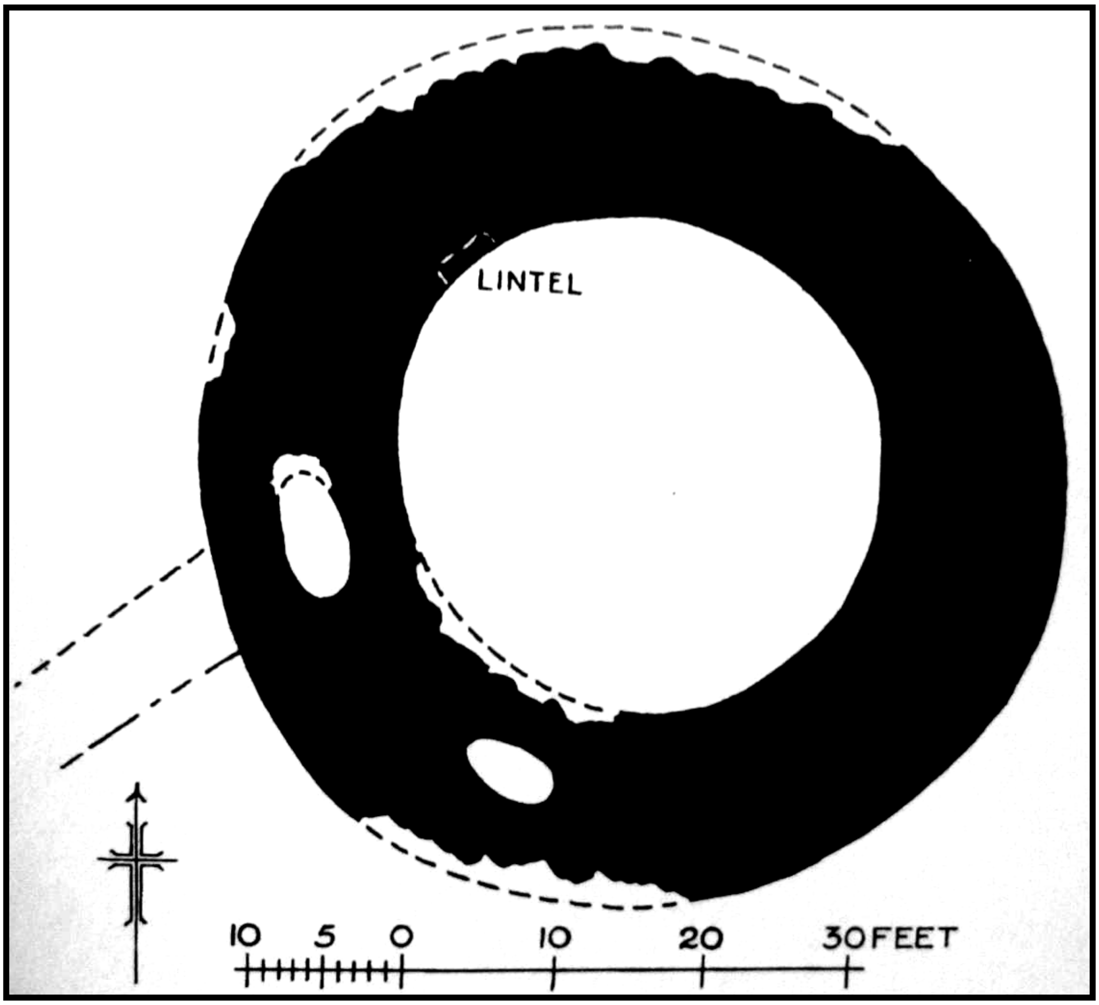


Figure 5.139. Multiple Viewsheds of Clevigarth Broch.

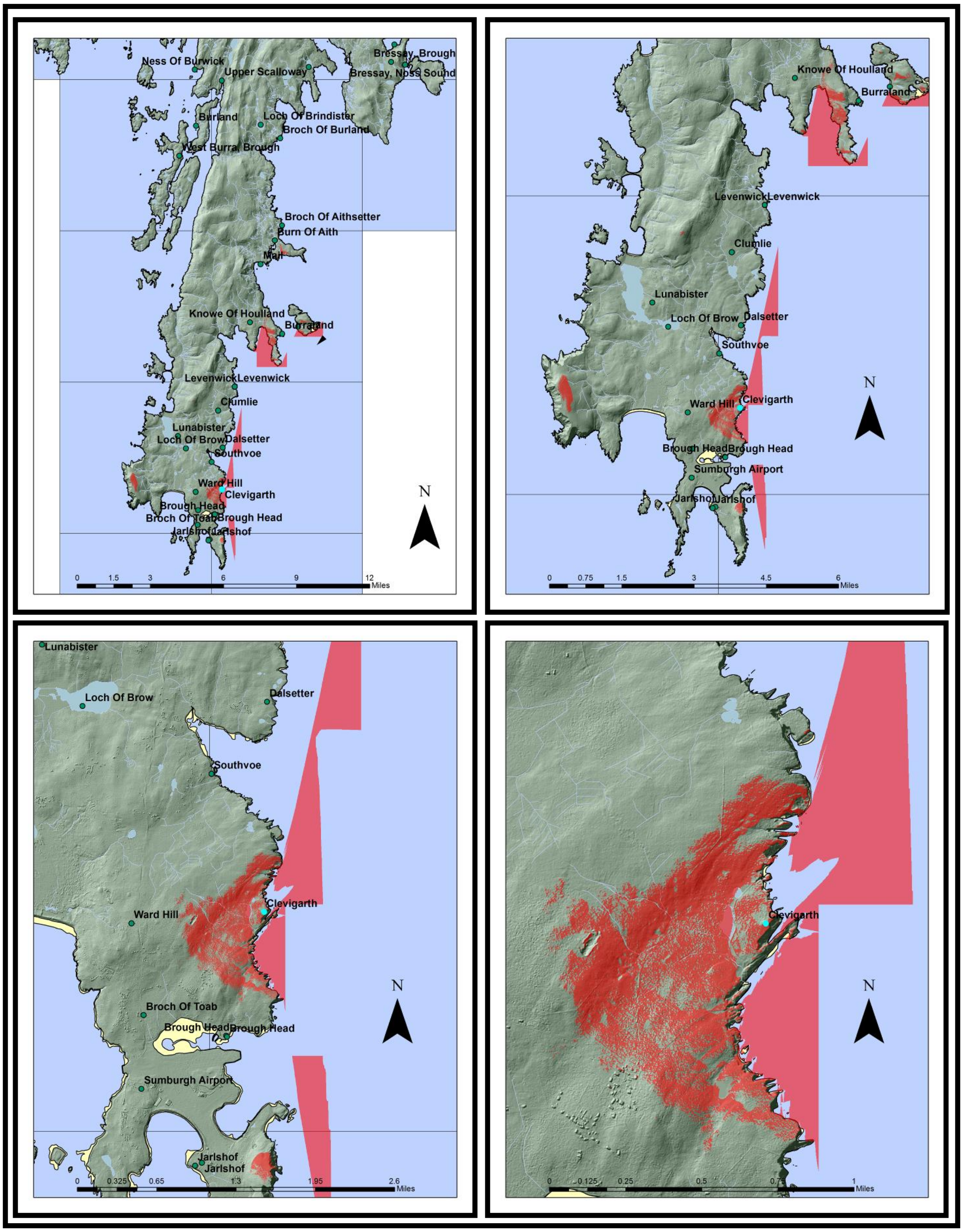


Figure 5.140. Sunrise (09:10 AM) to 14:30 PM around Clevigarth on the Winter Solstice (21st December). Red areas denote areas of shadow.

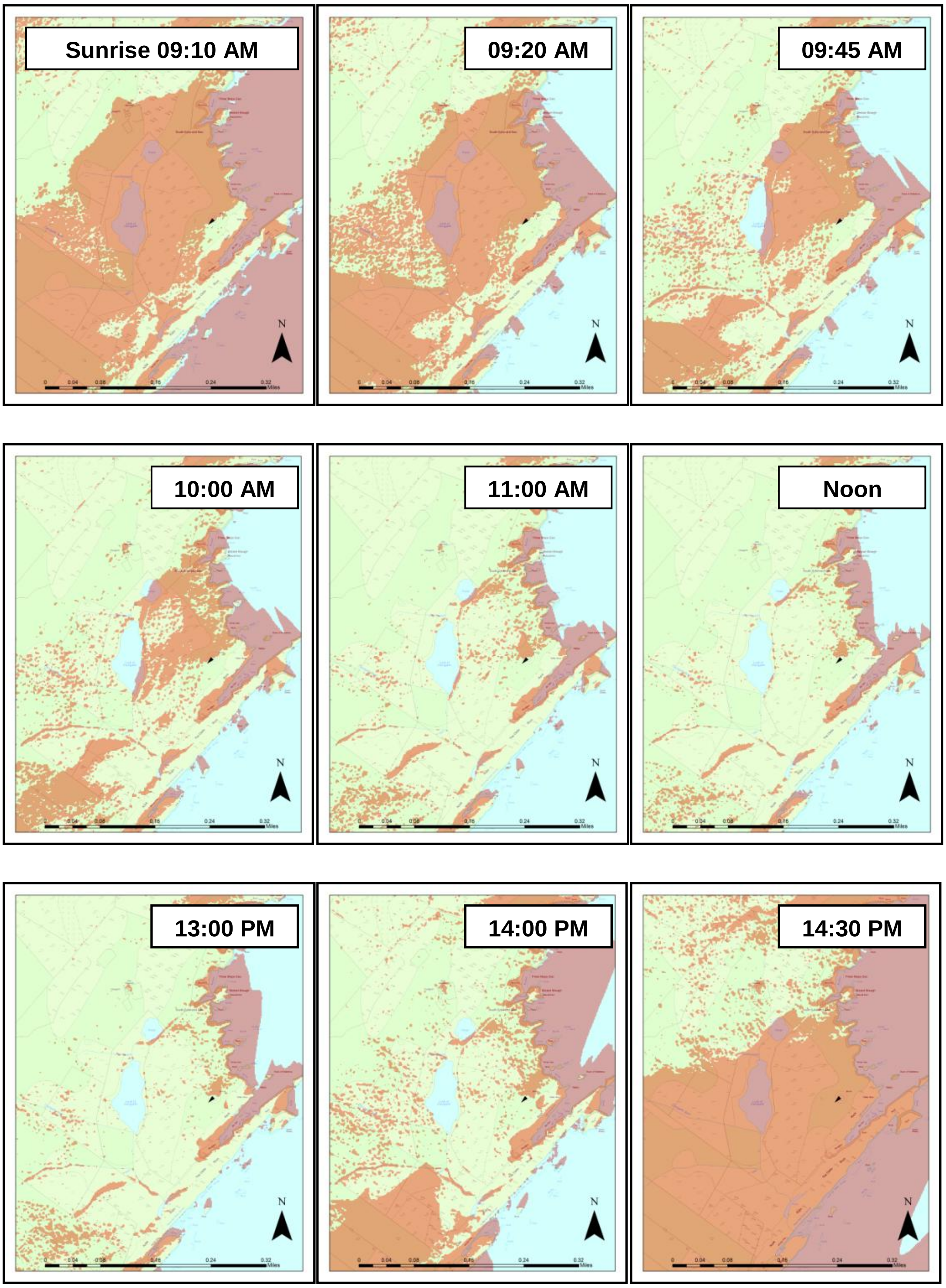


Figure 5.141. 14:45 PM to Sunset (14:55:45 PM) around Clevigarth on the Winter Solstice (21st December). Red areas denote areas of shadow.

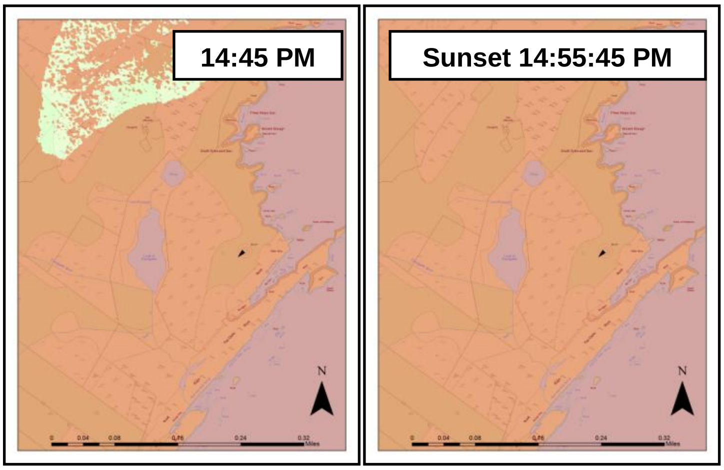


Figure 5.142. Sunrise (06:05:10 AM) to Noon around Clevigarth on the Spring Equinox (21st March). Red areas denote areas of shadow.

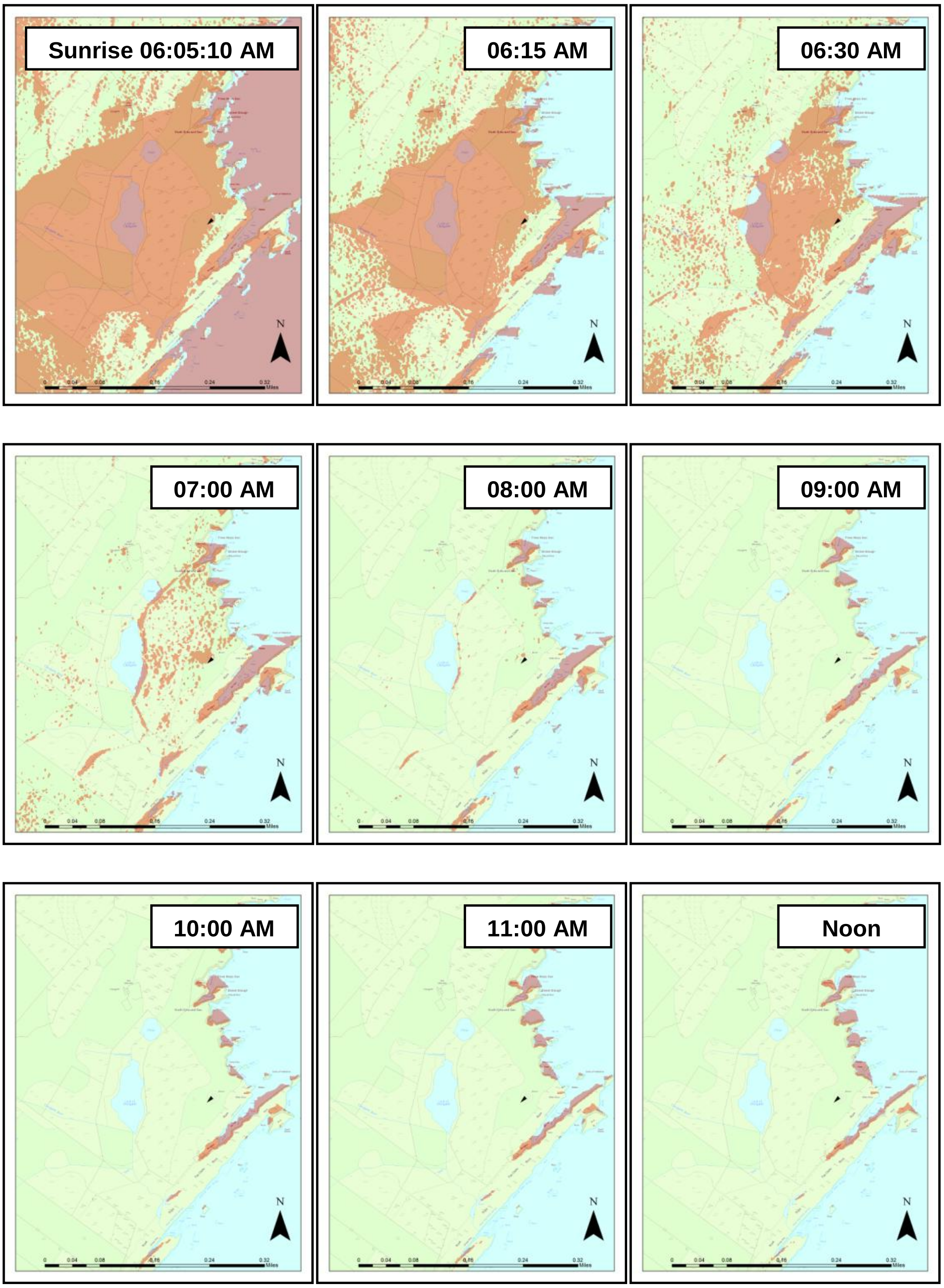


Figure 5.143. 13:00 PM to Sunset (18:19:50 PM) around Clevigarth on the Spring Equinox (21st March). Red areas denote areas of shadow.

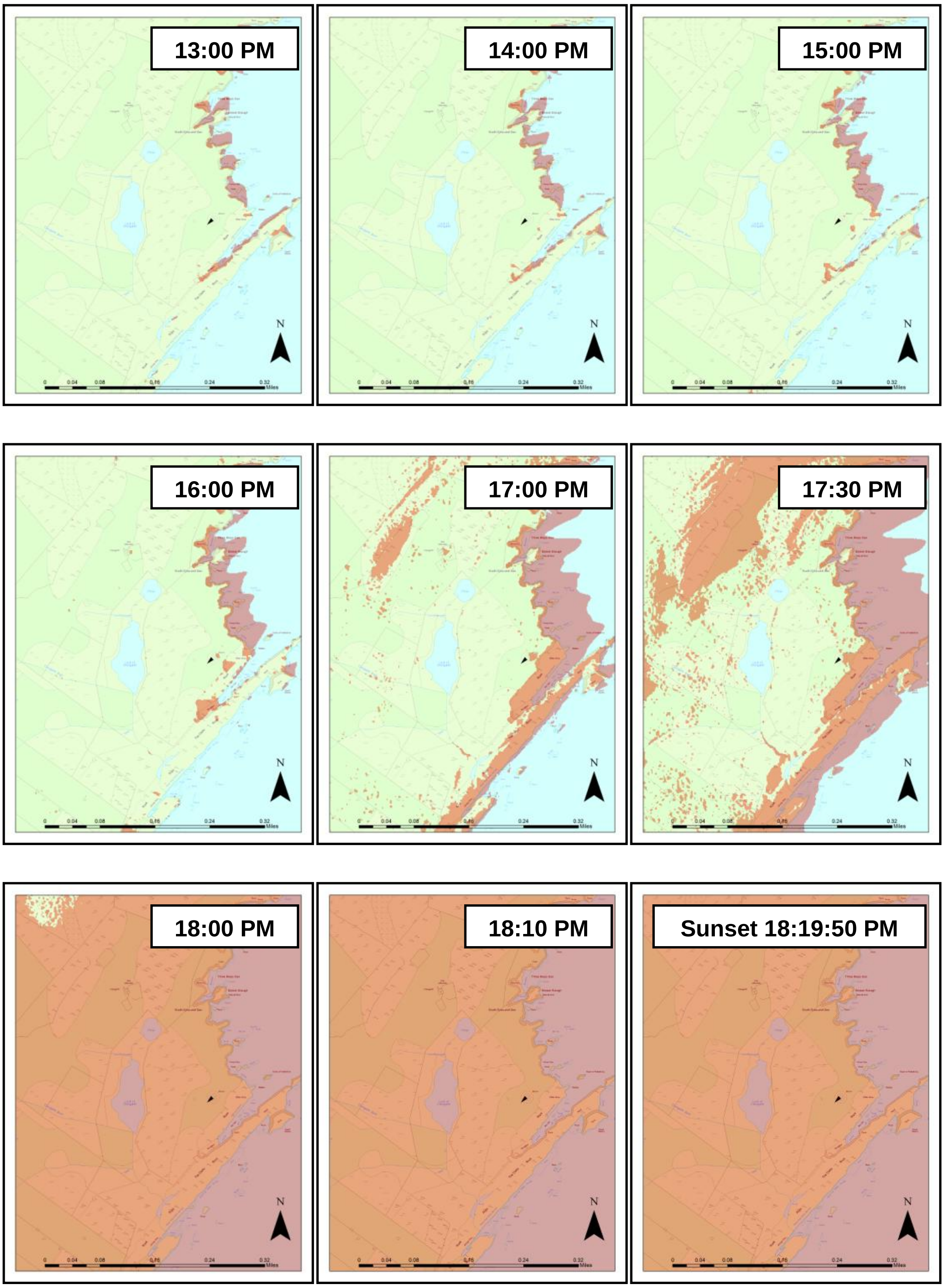


Figure 5.144. Sunrise (02:44:10 AM) to 10.00 AM around Clevigarth on the Summer Solstice (21st June). Red areas denote areas of shadow.

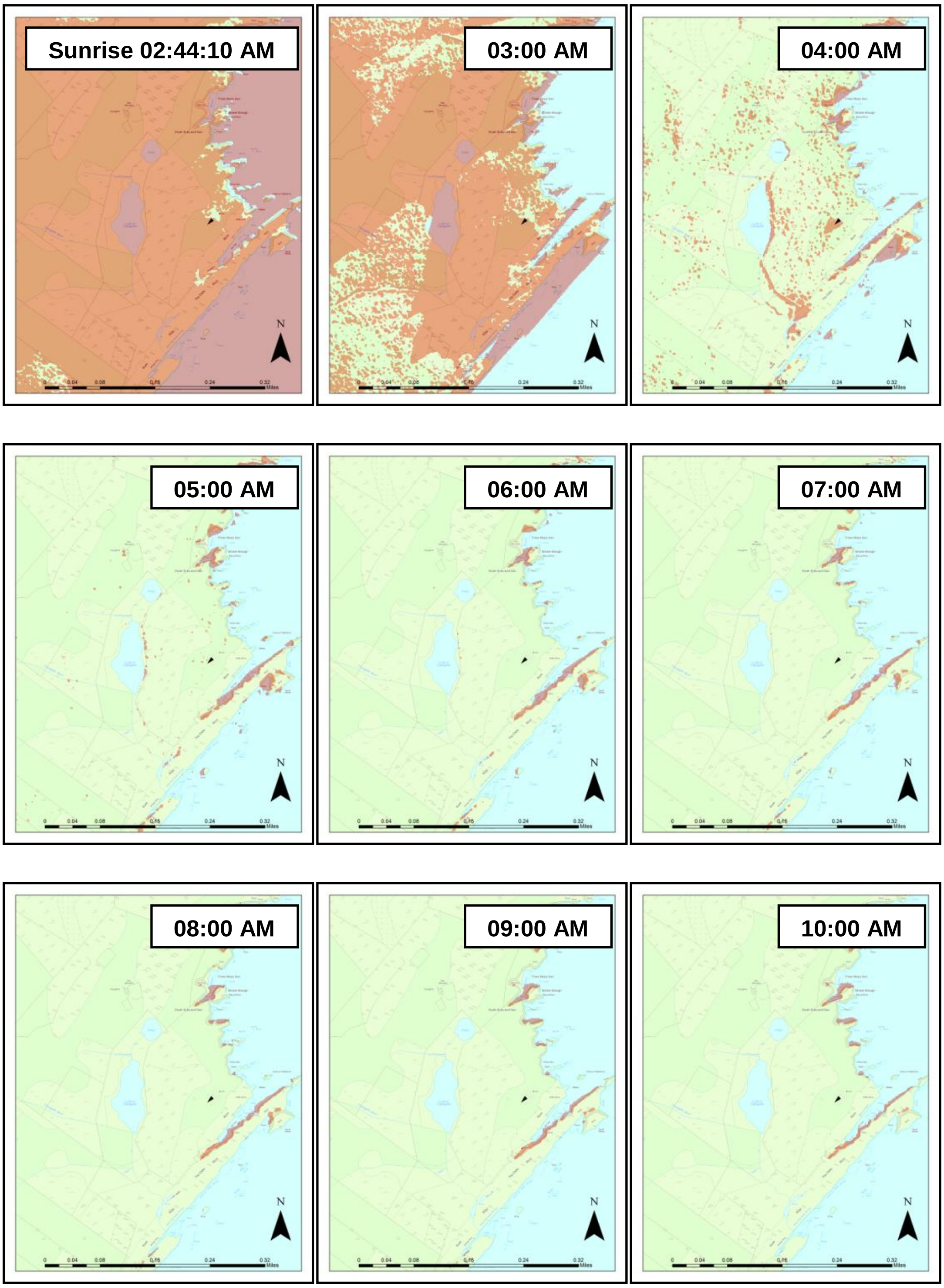


Figure 5.145. 11:00 AM to 19:00 PM around Clevigarth on the Summer Solstice (21st June). Red areas denote areas of shadow.

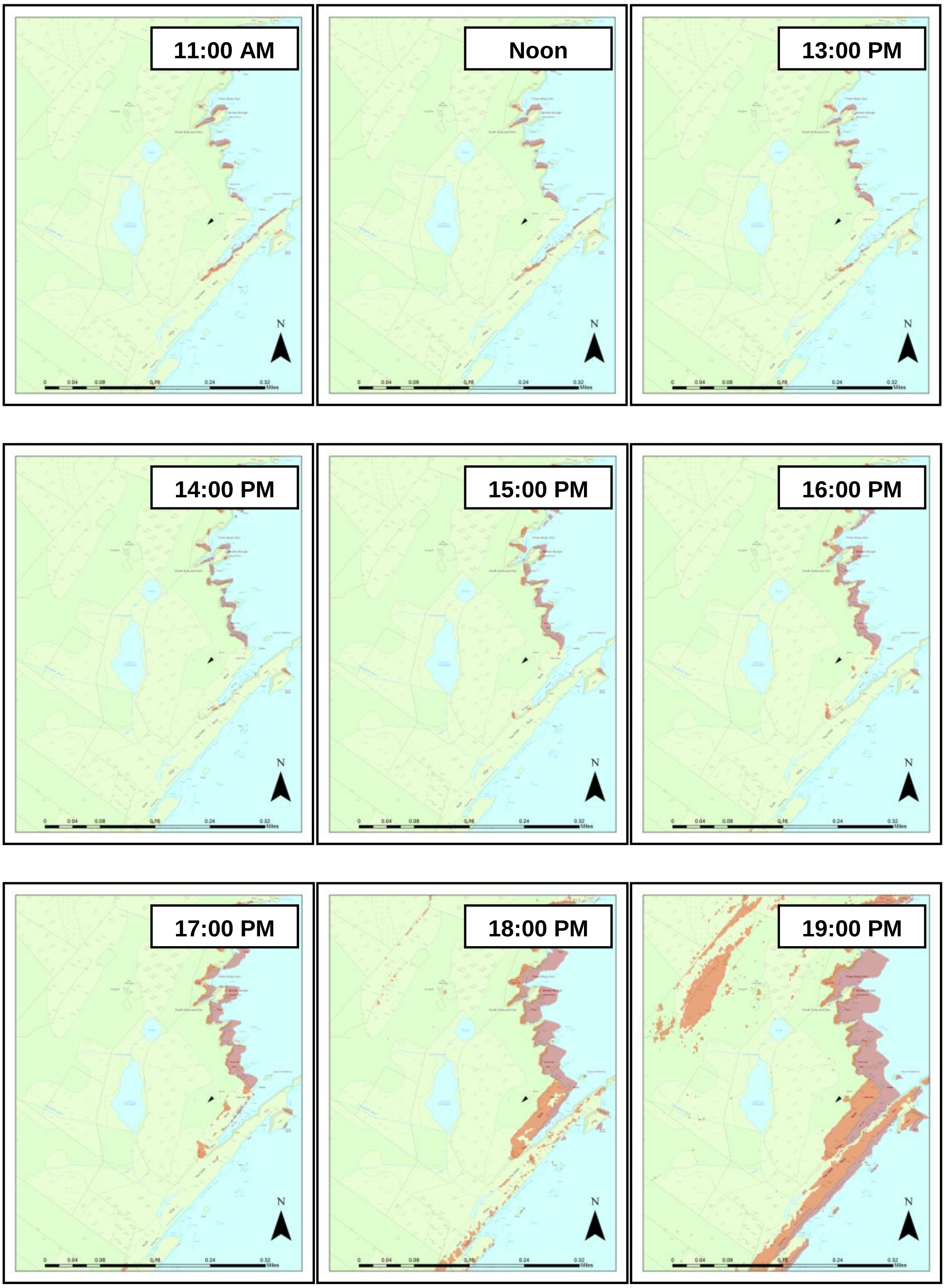
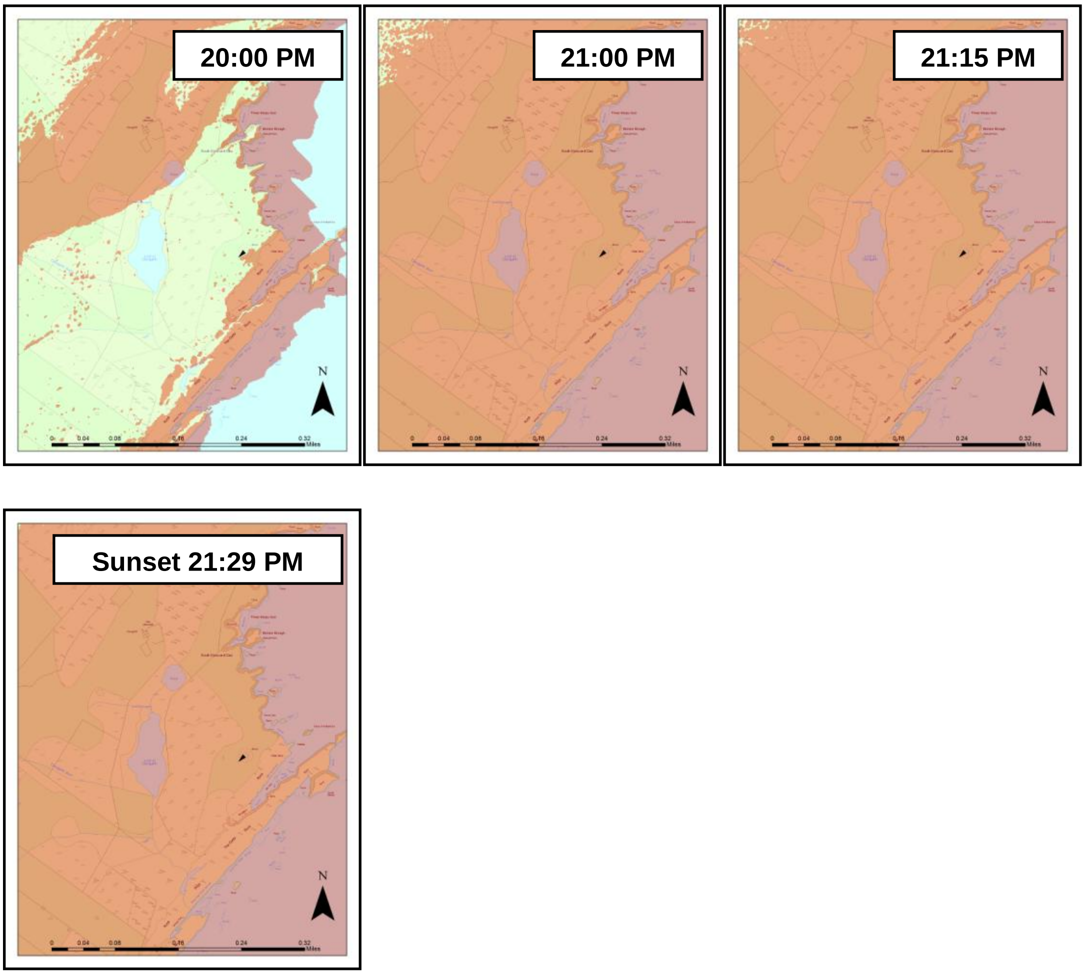


Figure 5.146. 20:00 PM to Sunset (21:29 PM) around Clevigarth on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 14: Brough Head

Canmore ID: 918

Entrance: SW

The Broch and its Landscape Context

Brough Head broch (Figures 5.147, 5.148, 5.149 and 5.150) has been heavily eroded by the sea (Carter, McCullagh and MacSween 1995: 478), and because of this, the interior stonework has been revealed, thereby allowing the structure to be examined in depth (McCullagh 1989: 68; 1990; Stewart 1956**;** Strong and Haggarty 1983). Built in an extremely advantageous location on a headland with open views over the harbour known as the Pool of Virkie, the broch probably held control over this particular natural harbour. Like many other brochs, it has extensive views of the sea around the approach to the harbour (Figure 5.151). Unlike many other brochs however, it has good views of the surrounding topography, and there is a line-of-site towards two other brochs – Sumburgh Airport and Broch of Toab. All in all, this suggests the broch was meant to be highly visible from the land and from the sea, and was intended to be positioned on the narrowest and highest section around the nearest natural harbour.

The Winter Solstice (21st December) – Figures 5.152 and 5.153

At sunrise, the broch is not immediately lit by the sun, but ten minutes later, at 09:20 AM, the SE section of the broch does gain light. The broch remains in light throughout the day, until only a few minutes before sunset, when the SW entrance finally loses sunlight. Though much of the surrounding landscape remains in the shade, the broch retains light until just before sunset, demonstrating the excellent choice of position and orientation for this site.

The Equinox (21st March) – Figures 5.154 and 5.155

In spring and autumn, the site is one of the first places to immediately gain direct sunlight at dawn. It retains light for much of the day, until near sunset. The SW entrance would have received light from mid-day to just before sunset, at 18:15 PM, again suggesting that the SW entrance was a good and practical choice.

The Summer Solstice (21st June) Figures 5.156, 5.157 and 5.158

At sunrise, the site is in the shade, and by 03:00 AM it still remains so. By 04:00 AM, the site is in direct light, remaining so for the day. However, in the summer, the western side of the broch loses light, due to the hills in the north-west which obscure the setting sun. Between 20:00 PM and 21:00 PM, the broch falls into the shade, nearly an hour before sunset.

Conclusion

Throughout much of the year, the SW entrance receives marginally more light than an eastern entrance would have. This choice to orientate SW may have been influenced not only by light availability in winter, but also by the fact that the broch lies on the NE edge of a headland, and is thus vulnerable to SE winds coming off the sea. Nevertheless, it still faces the prevailing SW winds; an orientation which may have seemed acceptable given the exposed location of this broch.

Figure 5.147. Eroded remains of Brough Head.
Author's Photo, from the north-east.

Figure 5.148. View towards the south-west from Brough Head.
Author's Photo.

Figure 5.149. View towards the north-east from Brough Head. Author’s Photo.

Figure 5.150. Ground Plan of Brough Head Broch.
(After Carter, McCullagh and MacSween 1995: 448; fig. 12)

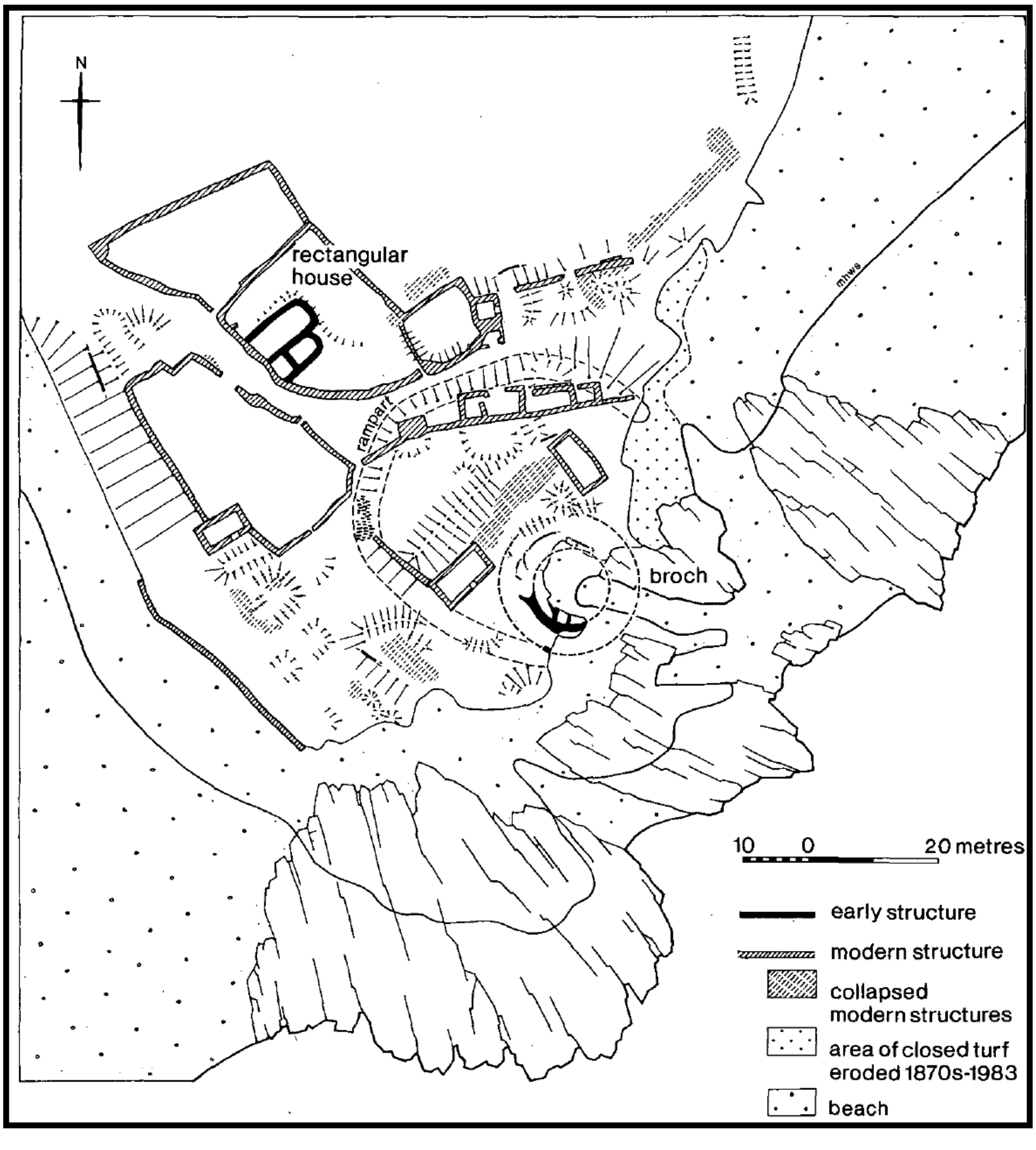
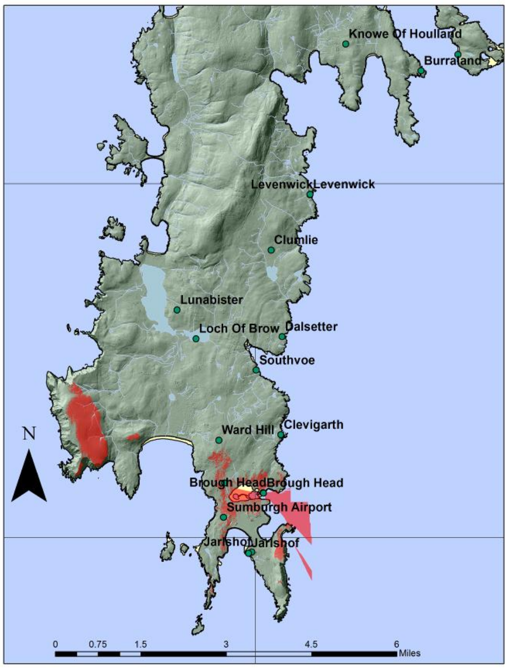


Figure 5.151. Multiple Viewsheds of Brough Head Broch.



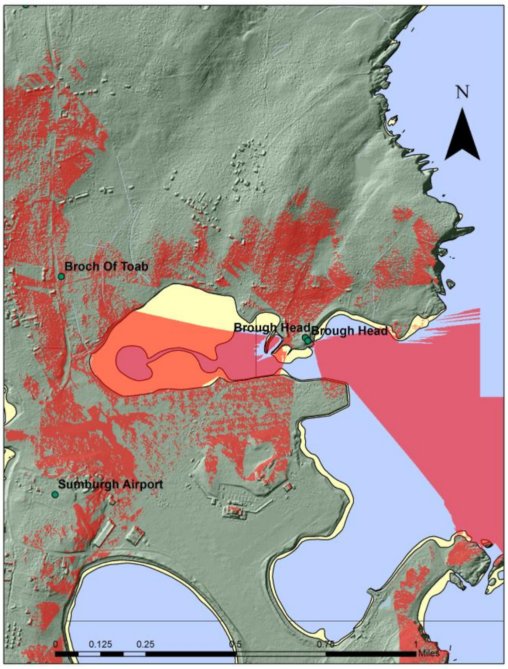


Figure 5.152. Sunrise (09:10 AM) to 14:30 PM around Brough Head on the Winter Solstice (21st December). Red areas denote areas of shadow.

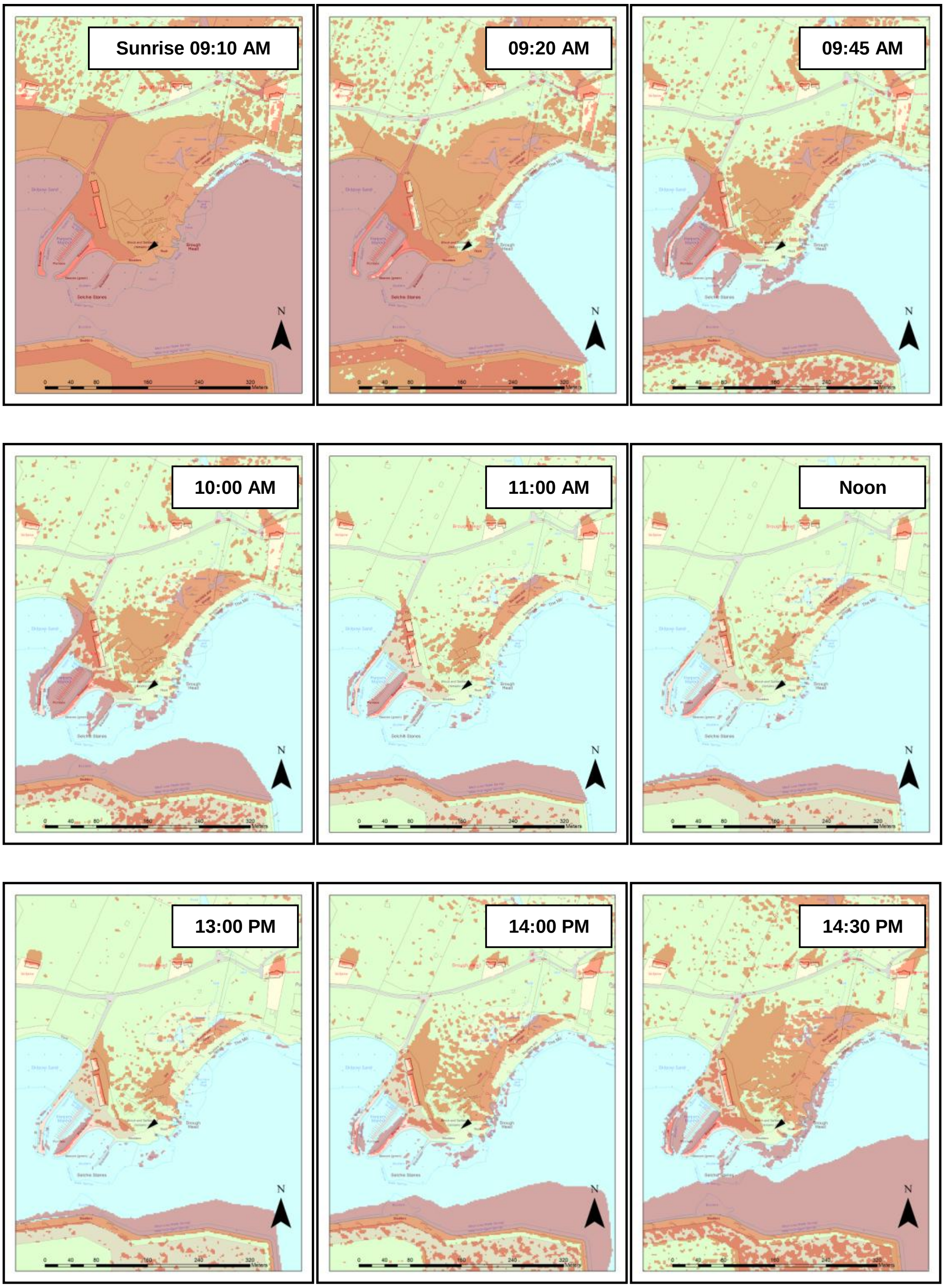


Figure 5.153. 14:45 PM to Sunset (14:55:45 PM) around Brough Head on the Winter Solstice (21st December). Red areas denote areas of shadow.

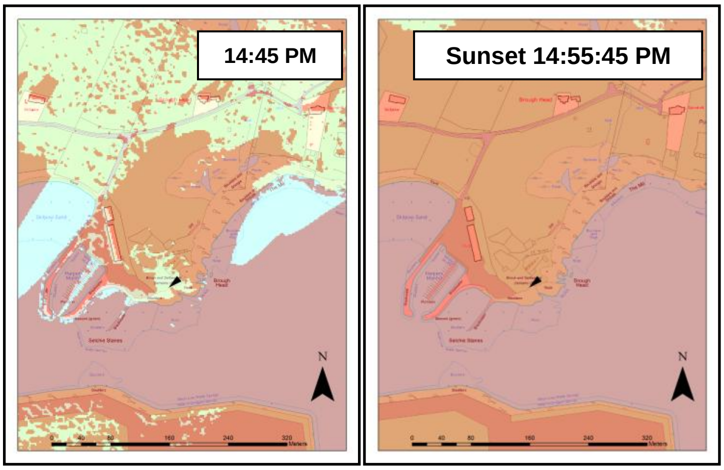


Figure 5.154. Sunrise (06:05:10 AM) to Noon around Brough Head on the Spring Equinox (21st March). Red areas denote areas of shadow.

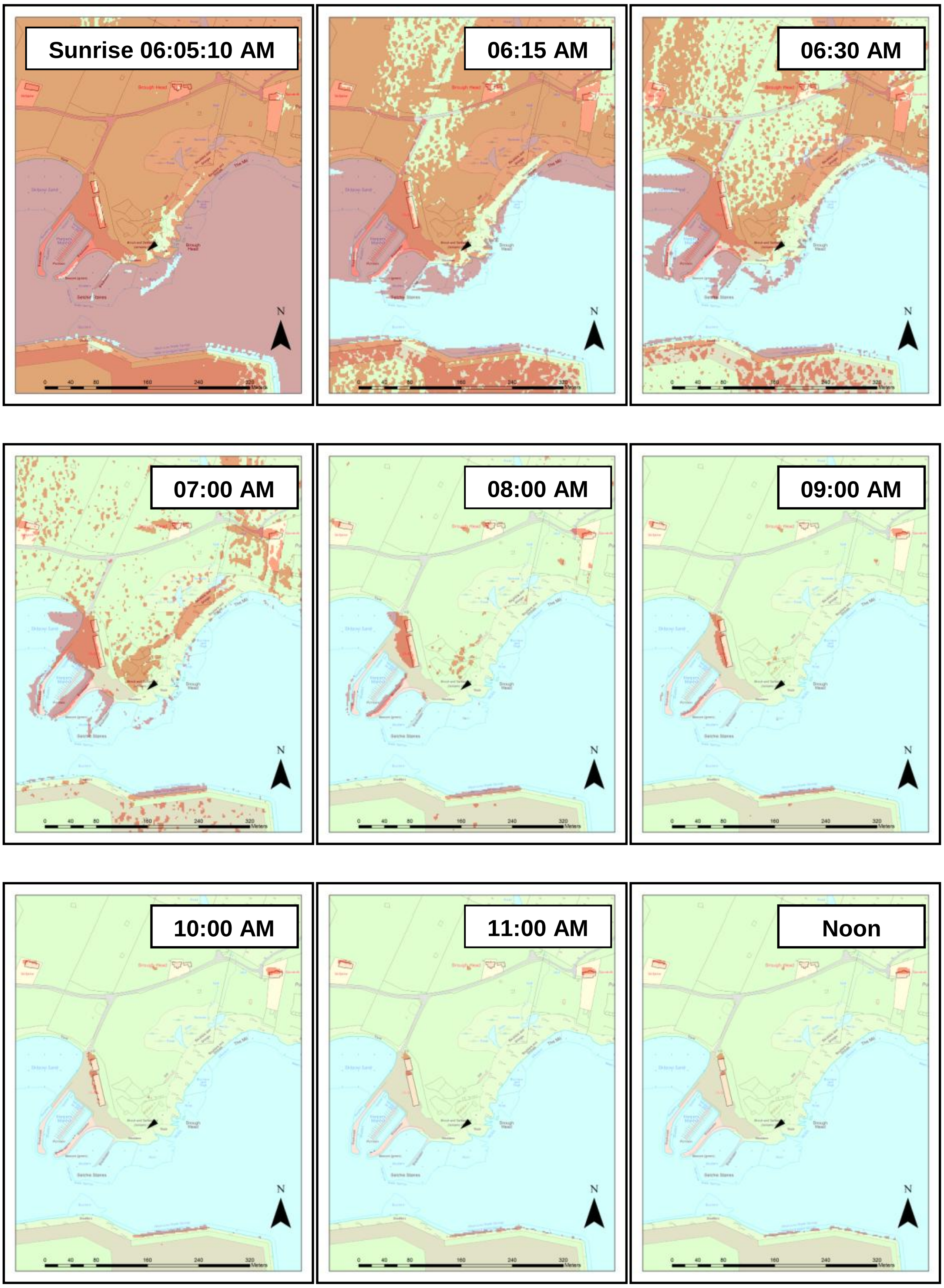


Figure 5.155. 13:00 PM to Sunset (18:19:50 PM) around Brough Head on the Spring Equinox (21st March). Red areas denote areas of shadow.

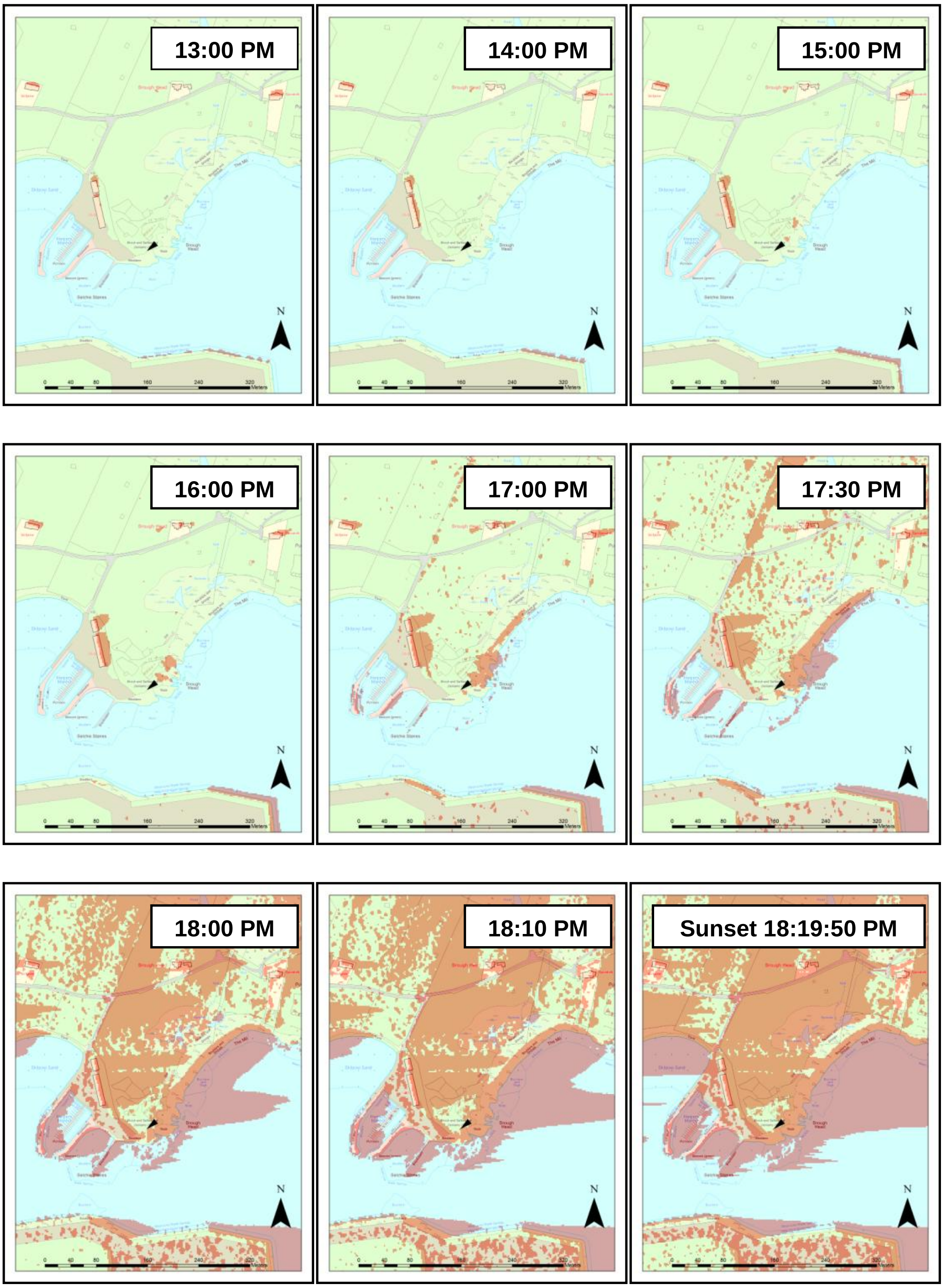


Figure 5.156. Sunrise (02:44:10 AM) to 10:00 AM around Brough Head on the Summer Solstice (21st June). Red areas denote areas of shadow.

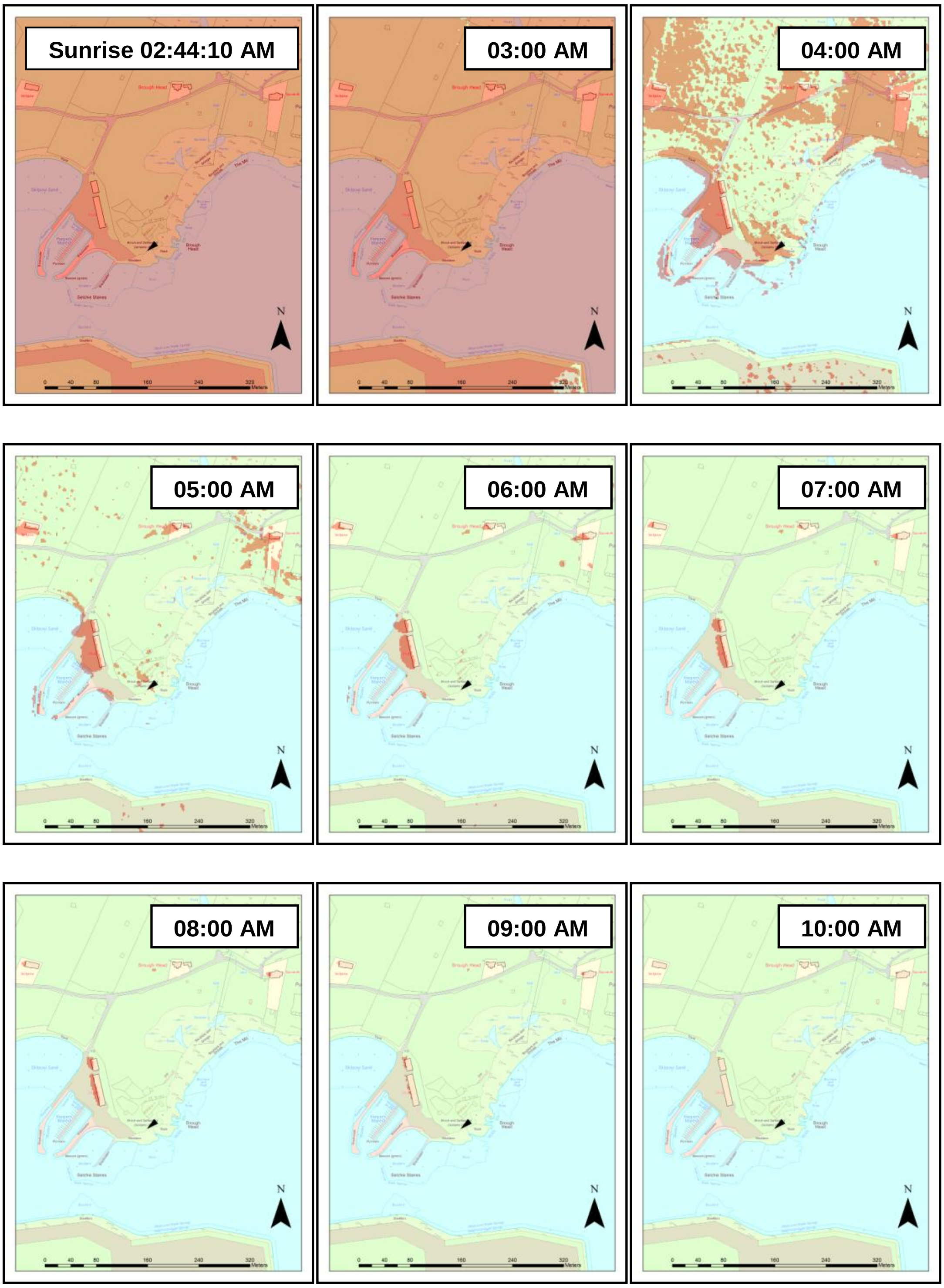


Figure 5.157. 11:00 AM to 19:00 PM around Brough Head on the Summer Solstice (21st June). Red areas denote areas of shadow.

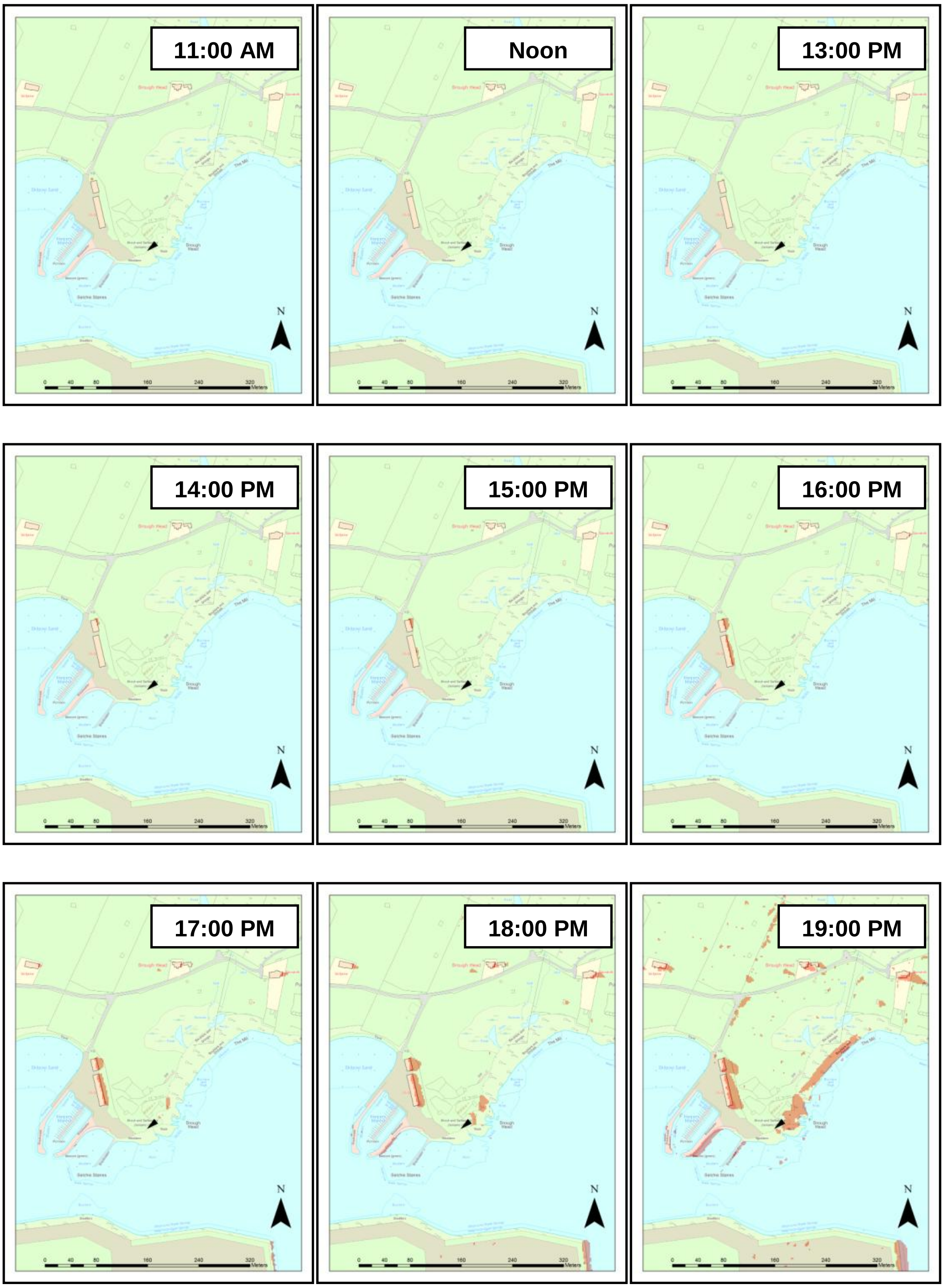
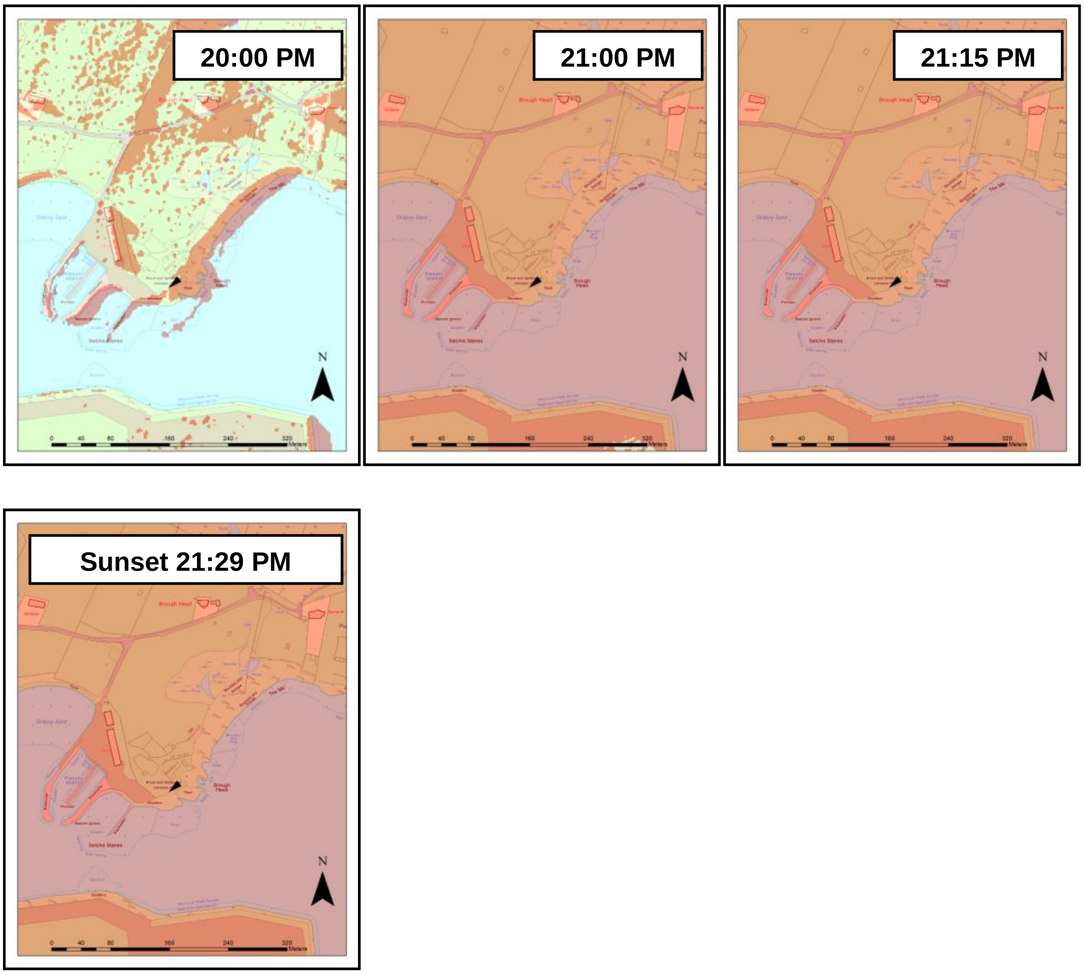


Figure 5.158. 20:00 PM to Sunset (21:29 PM) around Brough Head on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 15: Burland Broch

Canmore ID: 998

Entrance: SW

The Broch and its Landscape Context

Partially excavated in 1983 (Carter, McCullagh and MacSween 1995: 466-467; cf. Young 1961: 178), this broch (Figures 5.159 and 5.160) is bordered on three sides by steep cliffs, with the only approach from the north, barred also by three cross-walls with external ditches. Like many Shetland brochs, the entrance is located in the SW, only a few feet from the cliff edge (RCAHMS 1946: 70-72). Also like many other sites, Burland has no clear line-of-sight towards other brochs, but has excellent views of the sea and of nearby landing beaches (Figure 5.161). It does, however, have good views of the landscape to the west and south of the site.

The Winter Solstice (21st December) – Figures 5.162 and 5.163

Due to the lack of obstructions to the east of the site, as soon as the sun rises, the eastern side of the broch gains in light, and remains in it for the morning. By 14:15 PM, the sun begins to set over the SW cliffs, and by 14:30 PM, the broch remains one of the last places still to be lit. Between then and sunset, around twenty-five minutes later, the broch remains in the shade. Burland's SW entrance would thus not be as beneficial as a SE. Further, the fact that the SW entrance faces directly out over the cliffs and into what must have been very strong prevailing winds here, suggests that the entrance was probably exposed to extremely blustery weather in the winter.

The Equinox (21st March) – Figures 5.164 and 5.165

Though the broch, and its surrounding landscape, is not in direct light at sunrise, ten minutes later, the eastern and south-eastern half is. By 09:00 AM, much of the landscape is in direct sunlight, and remains so for most of the day. The landscape around the broch remains in light until around 17:30 PM, when the area is quickly shaded, so that by 18:00 PM, the broch and its landscape are in shadow, at least twenty minutes before sunset. Though the entrance would have received light between 13:00 PM and 17:30 PM, an eastern or south-eastern entrance would have probably benefited more, receiving light from 06:20 AM to around noon, if not slightly earlier.

The Summer Solstice (21st June) Figures 5.166, 5.167 and 5.168

At sunrise, the broch and its landscape remains in shadow, and it is not until past 03:00 AM that it receives sunlight on its north-eastern side. Due to the high summer sun, the landscape around the broch remains in light for much of the day, and even at 20:30 PM, the broch and its landscape still receive sunlight. By 21:00 PM, the broch's north-western side is in light, but by 21:15 PM, the site and its landscape is in the shade, about fifteen minutes before sunset.

Conclusion

An orientation towards the SE or SW is particularly well suited to the low sunlight of winter. The fact that Burland faces into the strong prevailing winds of the SW, a direction which receives less light than a SE entrance would for this area, is intriguing, and functionally illogical when considering the need for both shelter and light.

Figure 5.159. Burland Broch, looking towards the SE.
Photograph taken by myself.

Figure 5.160. Ground Plan of Burland Broch.
(After RCAHMS 1946)

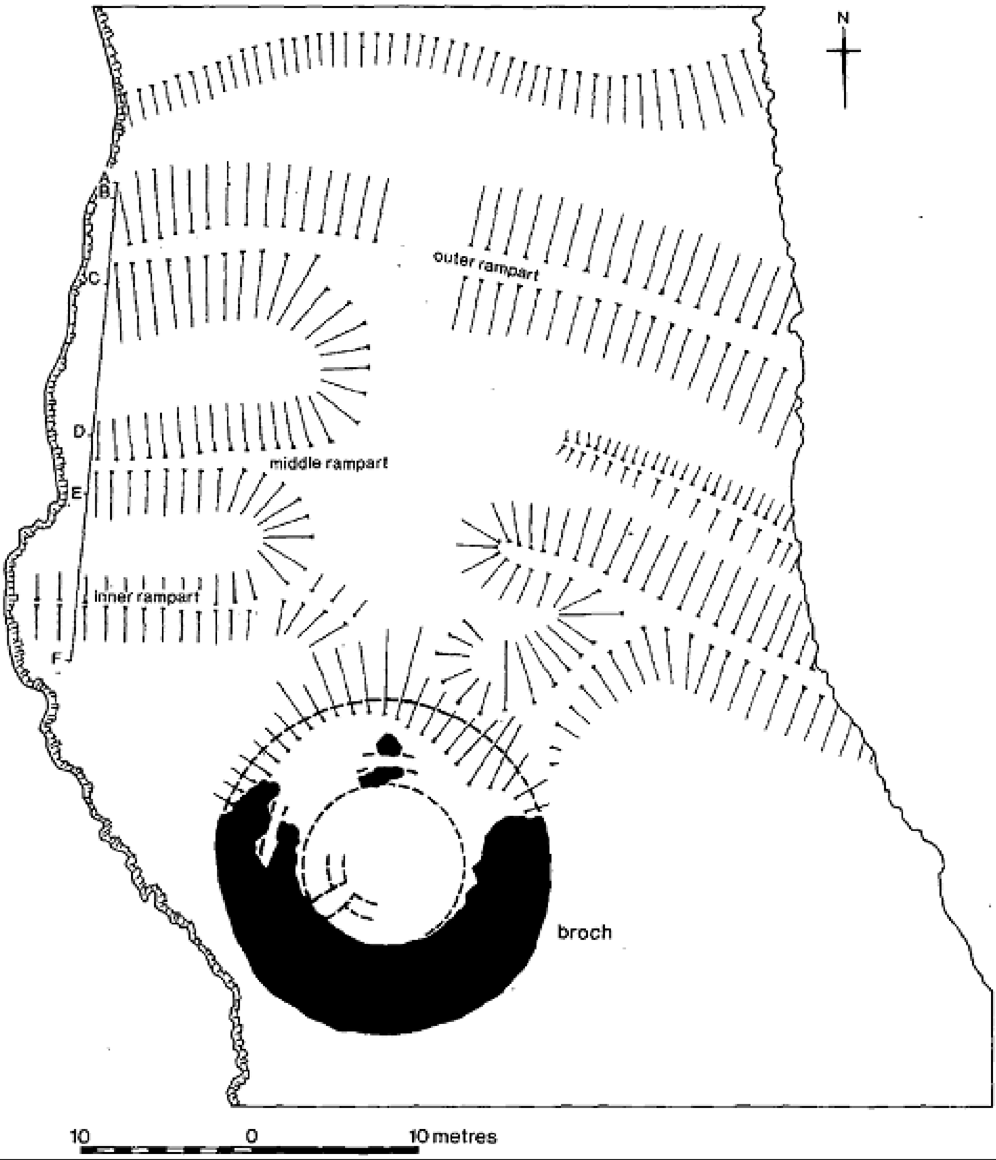


Figure 5.161. Multiple Viewsheds of Burland Broch.

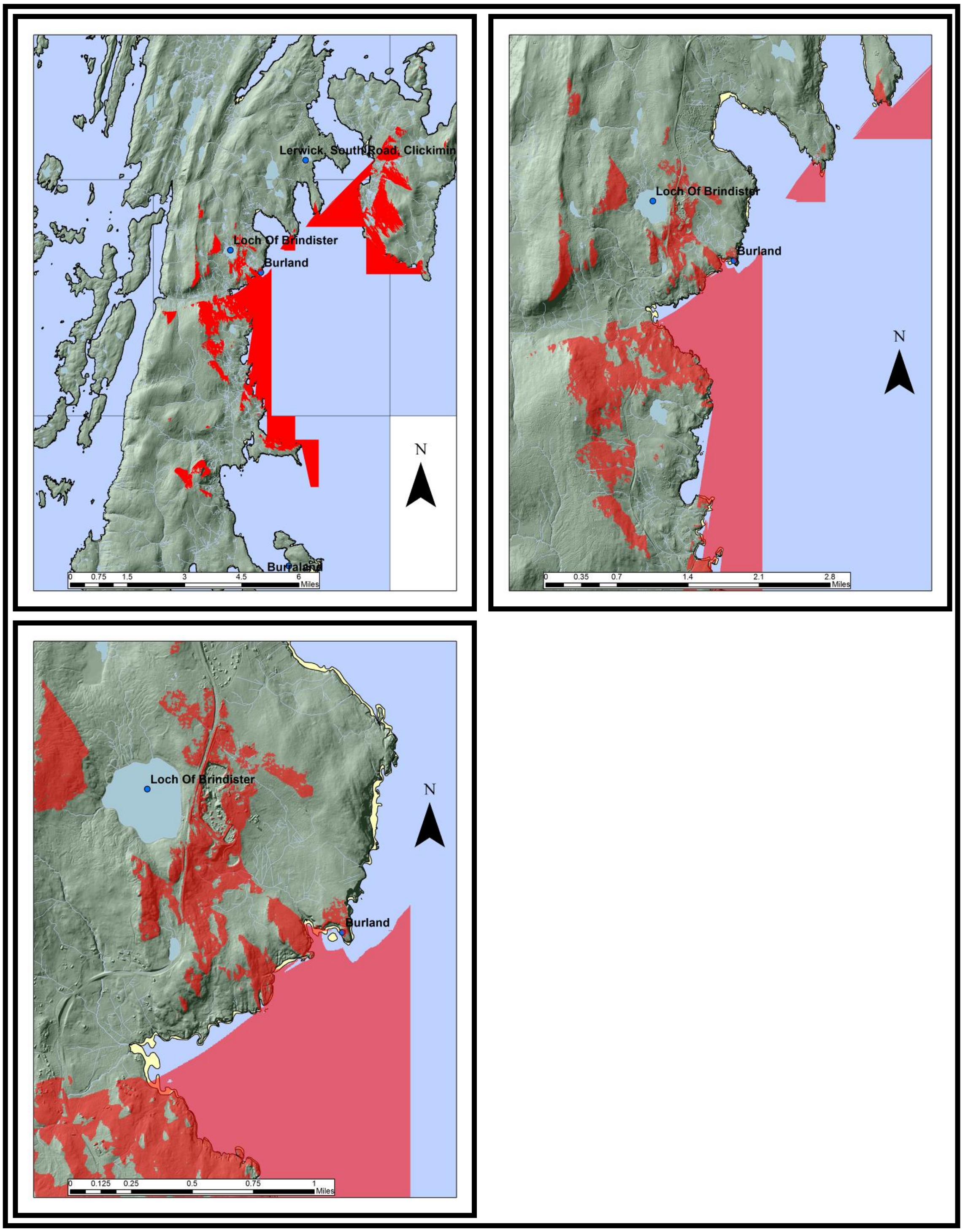


Figure 5.162. Sunrise (09:10 AM) to 14.15 PM around Burland on the Winter Solstice (21st December). Red areas denote areas of shadow.

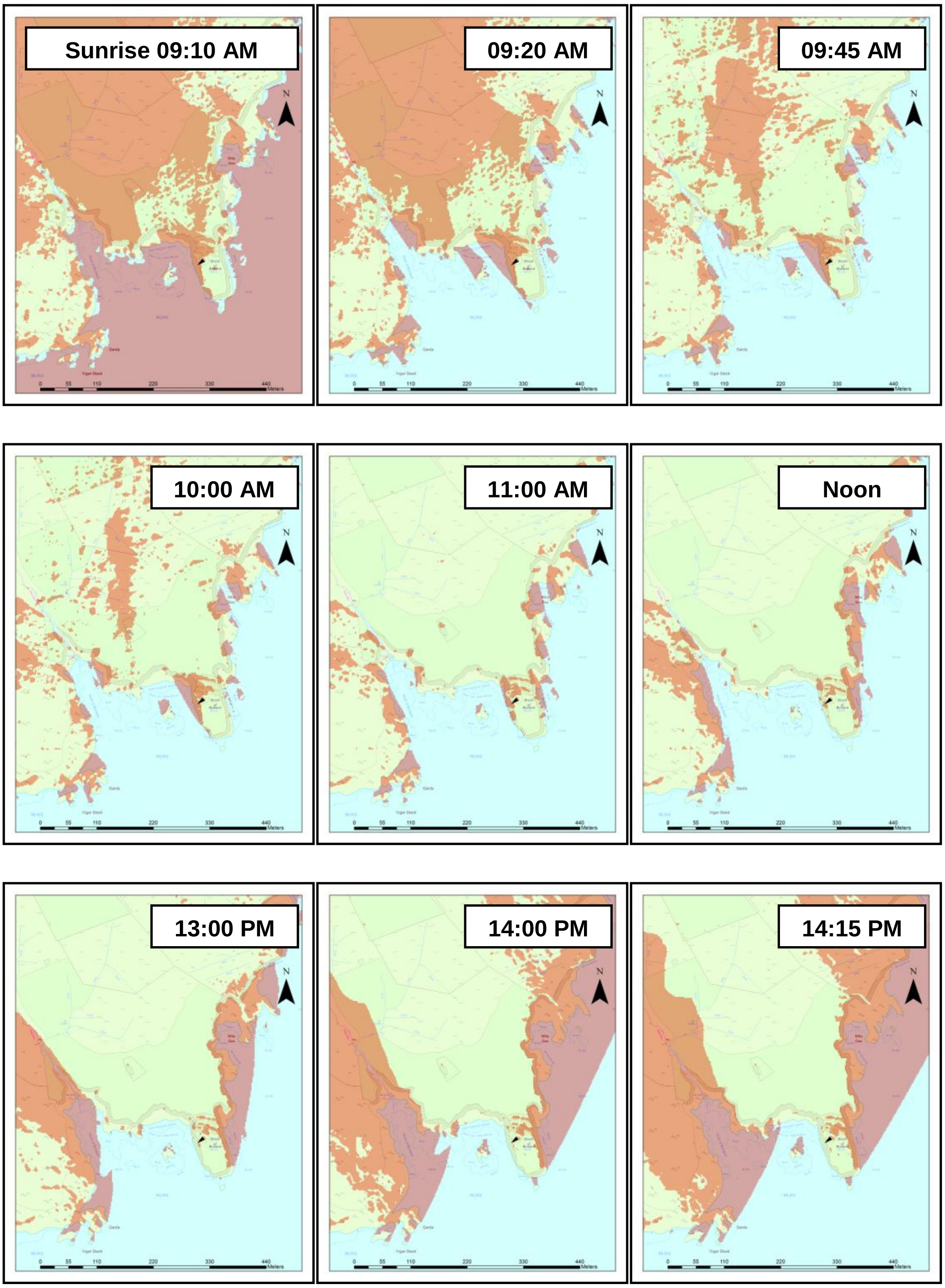


Figure 5.163. 14:45 PM to Sunset (14:55:45 PM) around Burland on the Winter Solstice (21st December). Red areas denote areas of shadow.

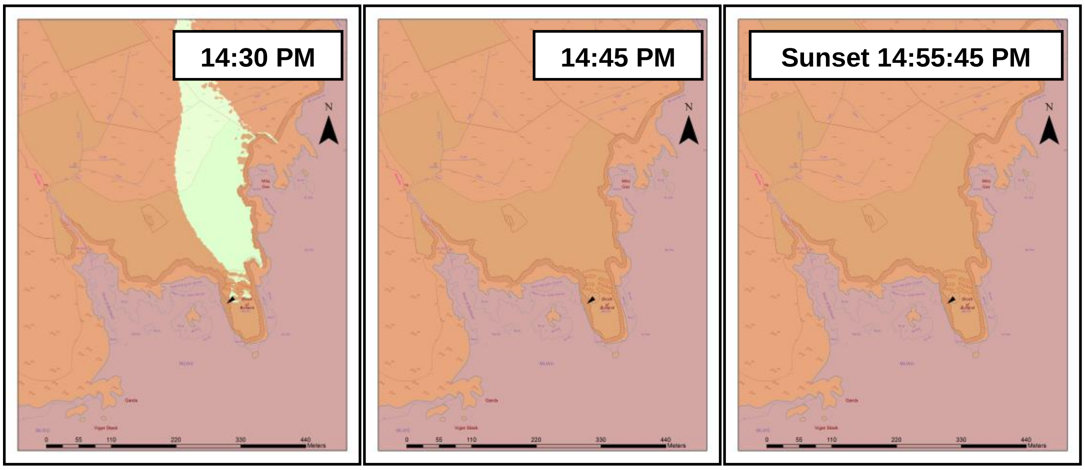


Figure 5.164. Sunrise (06:05:10 AM) to Noon around Burland on the Spring Equinox (21st March). Red areas denote areas of shadow.

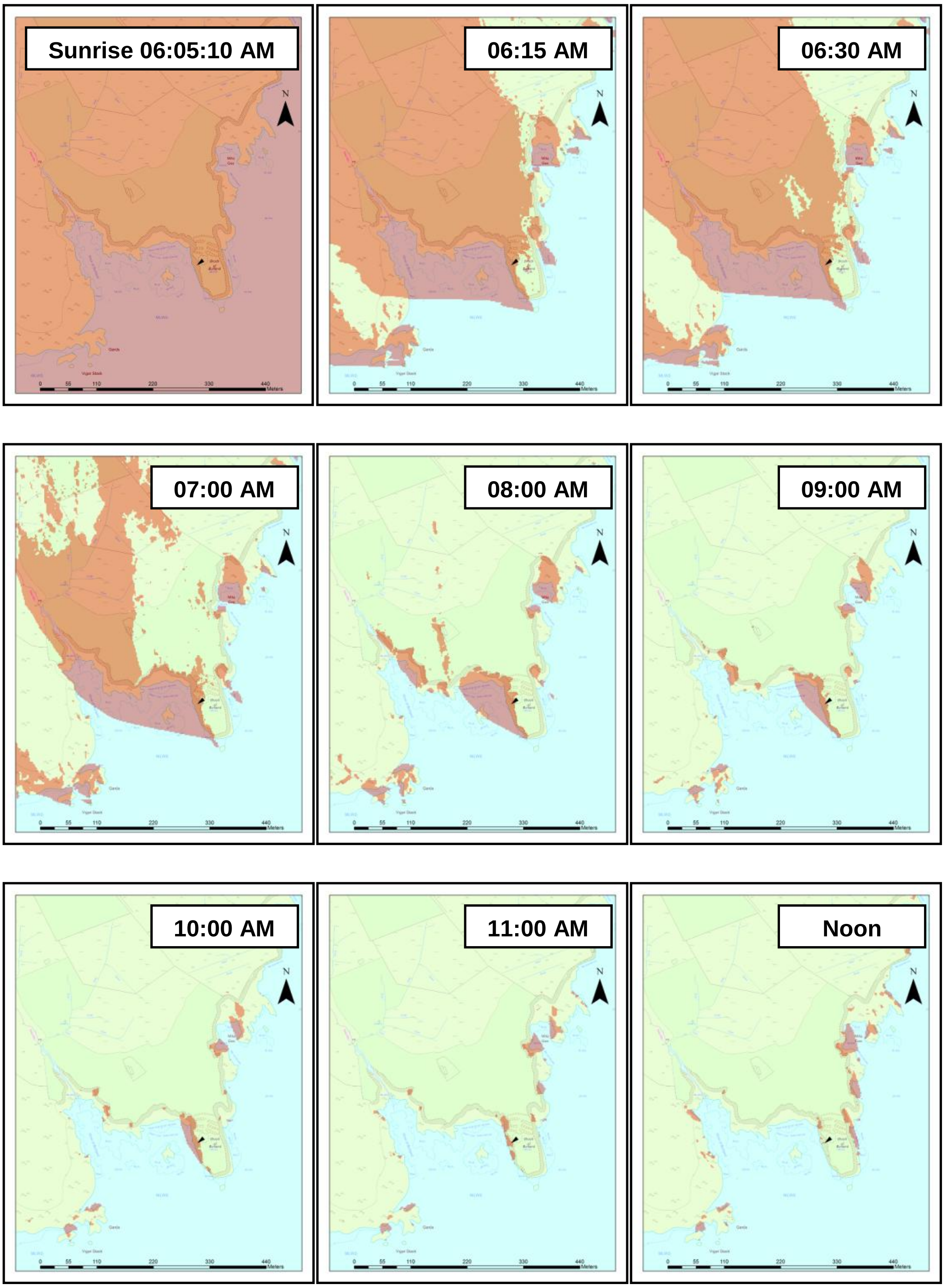


Figure 5.165. 13:00 PM to Sunset (18:19:50 PM) around Burland on the Spring Equinox (21st March). Red areas denote areas of shadow.

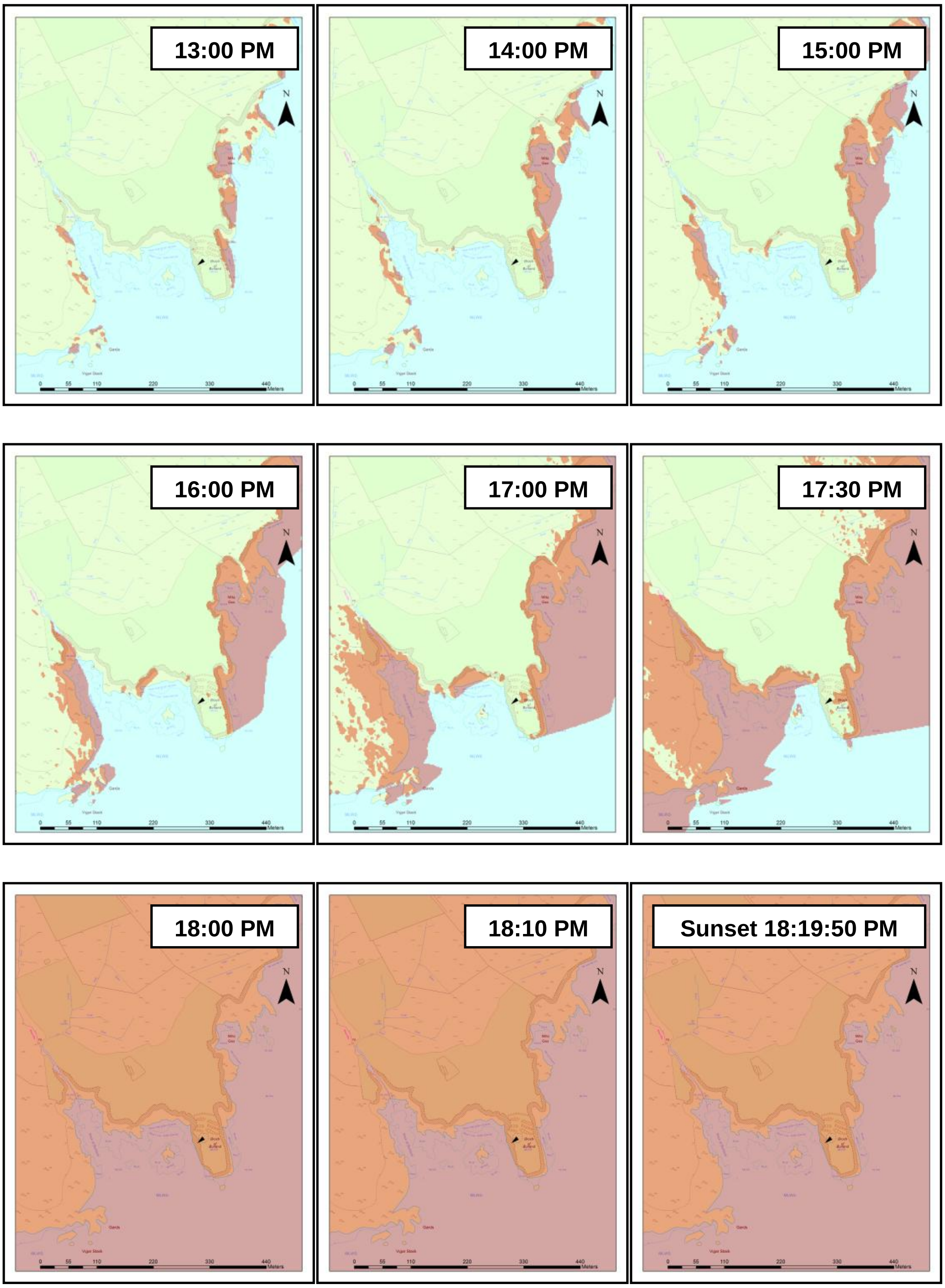


Figure 5.166. Sunrise (02:44:10 AM) to 09:00 AM around Burland on the Summer Solstice (21st June). Red areas denote areas of shadow.

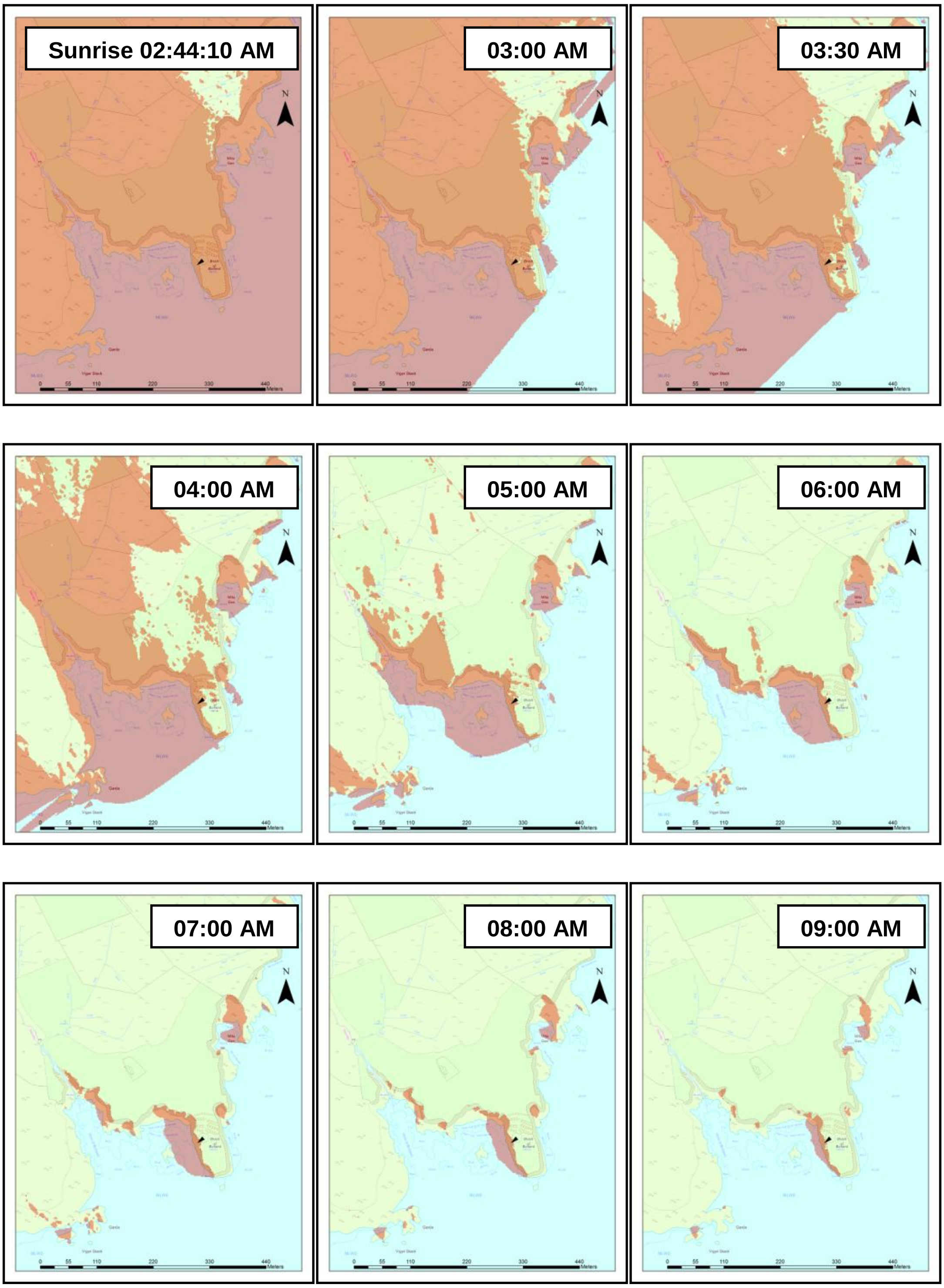


Figure 5.167. 10:00 AM to 18:00 PM around Burland on the Summer Solstice (21st June). Red areas denote areas of shadow.

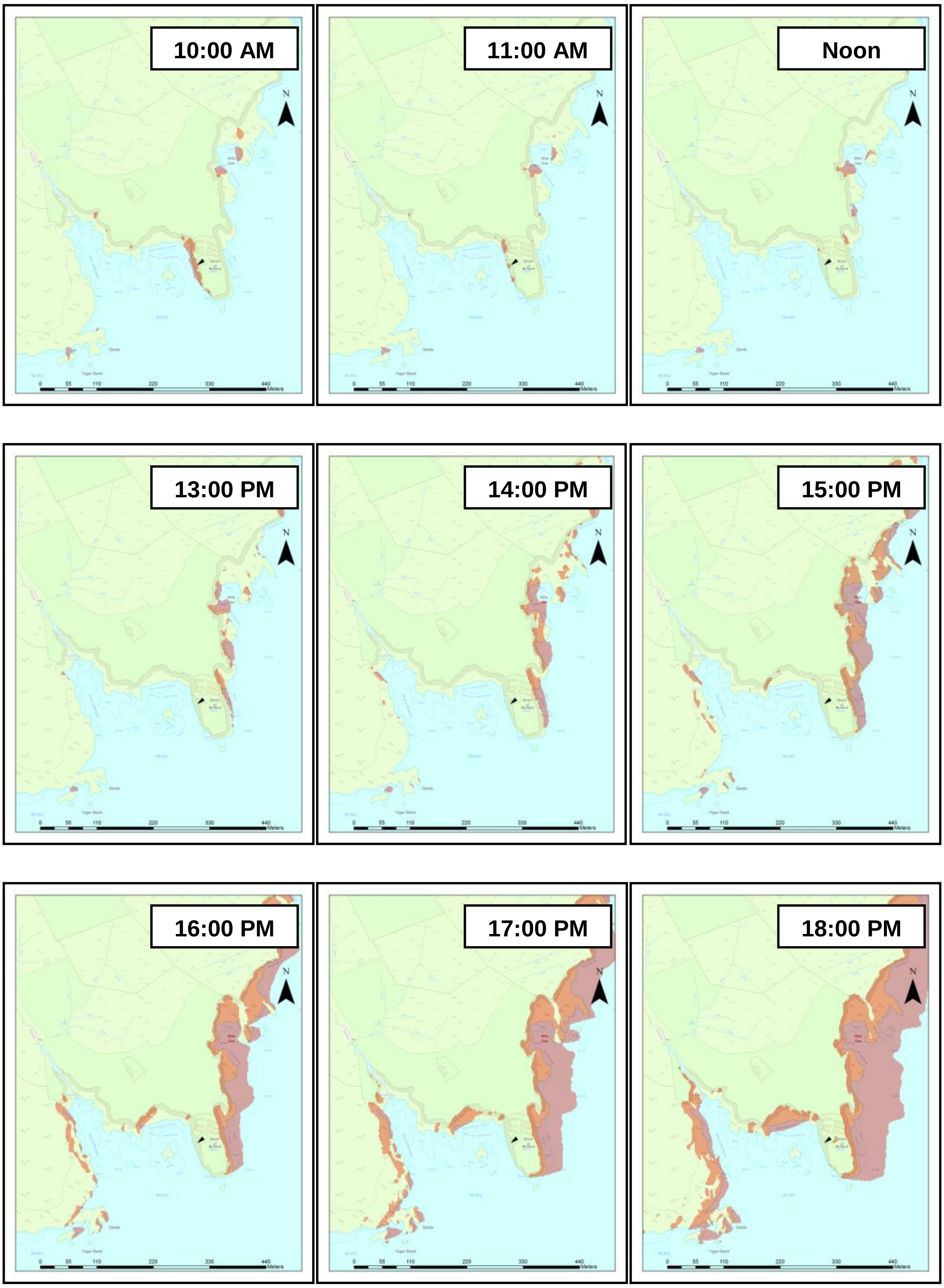
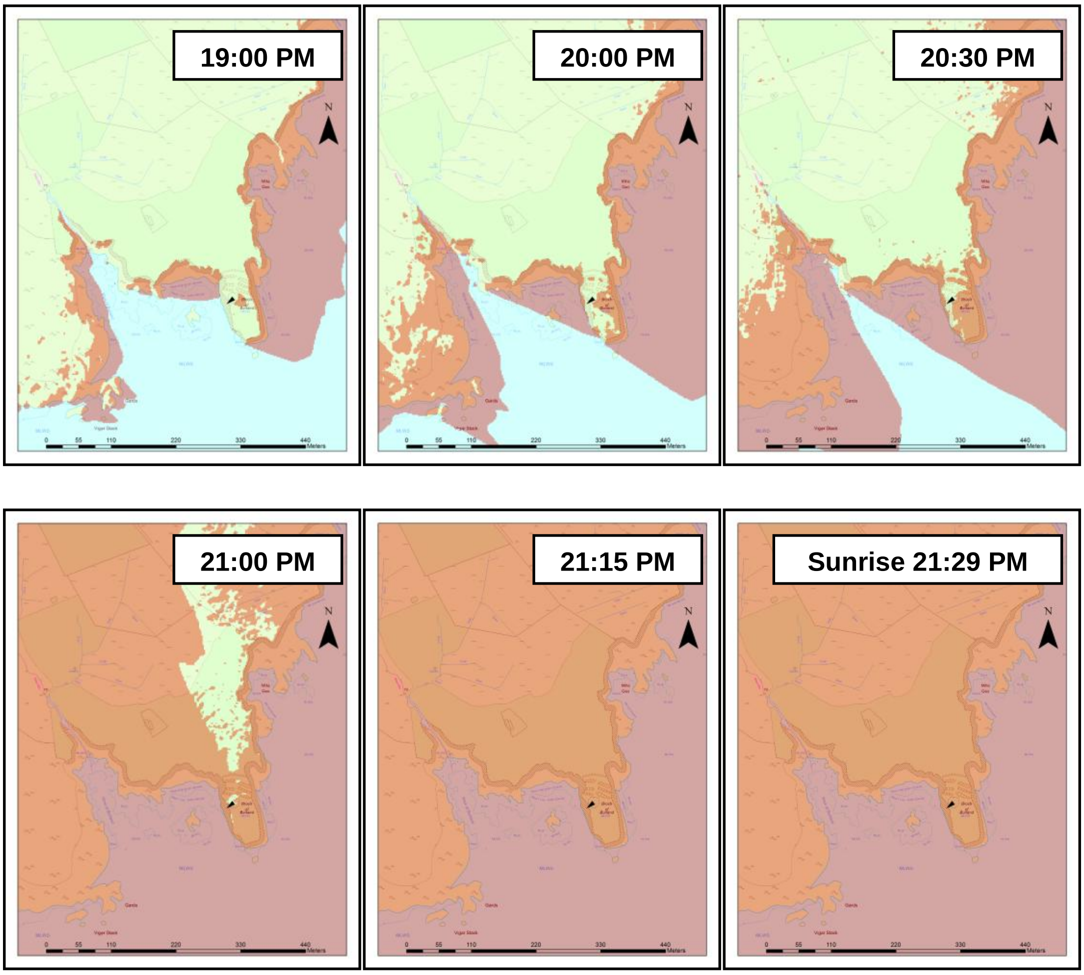


Figure 5.168. 19:00 PM to Sunset (21:29 PM) around Burland on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 16: Clickimin

Canmore ID: 1049

Entrance: SW

The Broch and its Landscape Context

Excavated between 1953 and 1957 by Hamilton (1954; 1963; 1968; 1983; cf. Turner 1990), Clickimin remains one of the best preserved and most imposing brochs not just in Shetland (Figures 5.169, 5.170, 5.171, 5.172 and 5.173), but in all of Atlantic Scotland (see Simpson 1954). Overlooking the southern entrance to Bressay Sound (Figure 5.174), which is a sheltered shipping channel that has provided safe anchorage for vessels for centuries, it would appear that Clickimin is an extremely well placed site. Modern Lerwick, where Clickimin is located, is the main harbour for Shetland itself, and this is primarily due to the fact that this area is sheltered from the North Sea, with the island of Bressay protecting it to the east. Boats travelling either north or east would probably have entered the sound then, and Clickimin's position overlooking this stretch of water would have allowed it to dominate the landscape from the seaward side especially. As we would expect then, it has limited views of Mainland Shetland (Figure 5.174), but has excellent views of Southern Bressay and the southern entrance to Bressay Sound itself. Again, this broch has no line-of-sight towards other brochs.

The Winter Solstice (21st December) – Figures 5.175 and 5.176

As the entrance faces SW, the broch interior would receive direct sunlight in the afternoon throughout the winter. At sunrise, the broch is without sunlight, and remains without sunlight until around an hour later, just after 10:00 AM. The loss of this hour's light may be the reason why the broch is orientated westward. However, by 14:00 PM, nearly an hour before sunset, the broch entrance loses direct sunlight. In this regard, the SW entrance receives just as much light in winter as a SE entrance would, suggesting that afternoon light was more valuable than morning light, as we see at numerous other brochs in Shetland.

The Equinox (21st March) – Figures 5.177 and 5.178

Again, at sunrise the broch is in the shade, but by 06:30 AM, less than half an hour after sunrise, the eastern side of the broch receives light. The broch continues to receive light for most of the day. The SW entrance would have gained light probably around 13:00 PM. The entrance and the broch fall into the shade between 17:00 PM and 17:30 PM, losing over an hour of light. In this regard, a SE entrance would have benefitted more than the SW entrance does, probably gaining an extra forty minutes of sunlight throughout the day. Again, this suggests the afternoon sun was cherished.

The Summer Solstice (21st June) Figures 5.179, 5.180 and 5.181

The NE side of the broch gains light around forty minutes after sunrise, and the broch continues to receive light throughout the day. The broch loses the late afternoon sun in midsummer much earlier than most brochs do in Shetland however, probably around ten to twenty minutes before 20:00 PM, nearly an hour and a half before the sun sets. This means that a western entrance would certainly lose more light than an eastern entrance during this period of the year.

Conclusion

In the winter, the SW entrance receives about the same amount of light than a SE entrance would have. However, throughout the rest of the year, it loses up to an hour more. This is especially relevant in the summer, where an eastern entrance would certainly have been of greater benefit than the western entrance. The entrance of the broch and its slight inclination towards the WSW suggests that it was the months of winter and early spring that the doorway was orientated towards, and that the afternoon sun was significant for its inhabitants.

Figure 5.169. Clickimin Broch.
Author's Photo, from the south.

Figure 5.170. View towards the WSW from Clickimin.
Author's Photo.

Figure 5.171. View from the SW-facing entrance of Clickimin. Author's Photo.

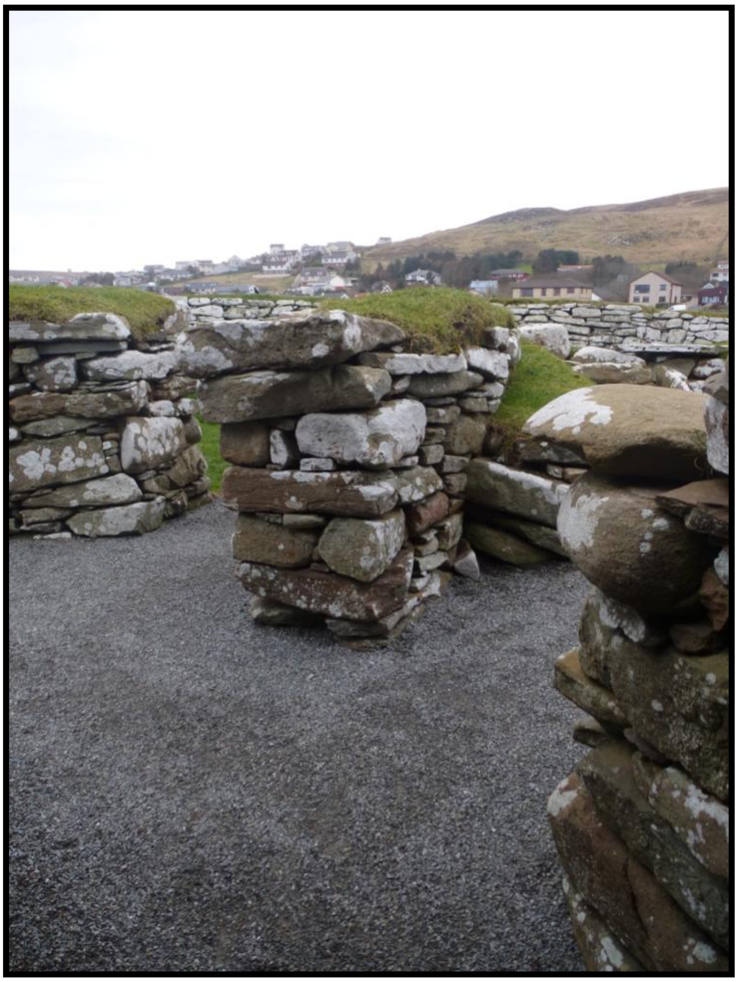


Figure 5.172. View towards the east from Clickimin. Author's Photo.

Figure 5.173. Ground Plan of Clickimin Broch.
(After: Dryden 1890: 207)

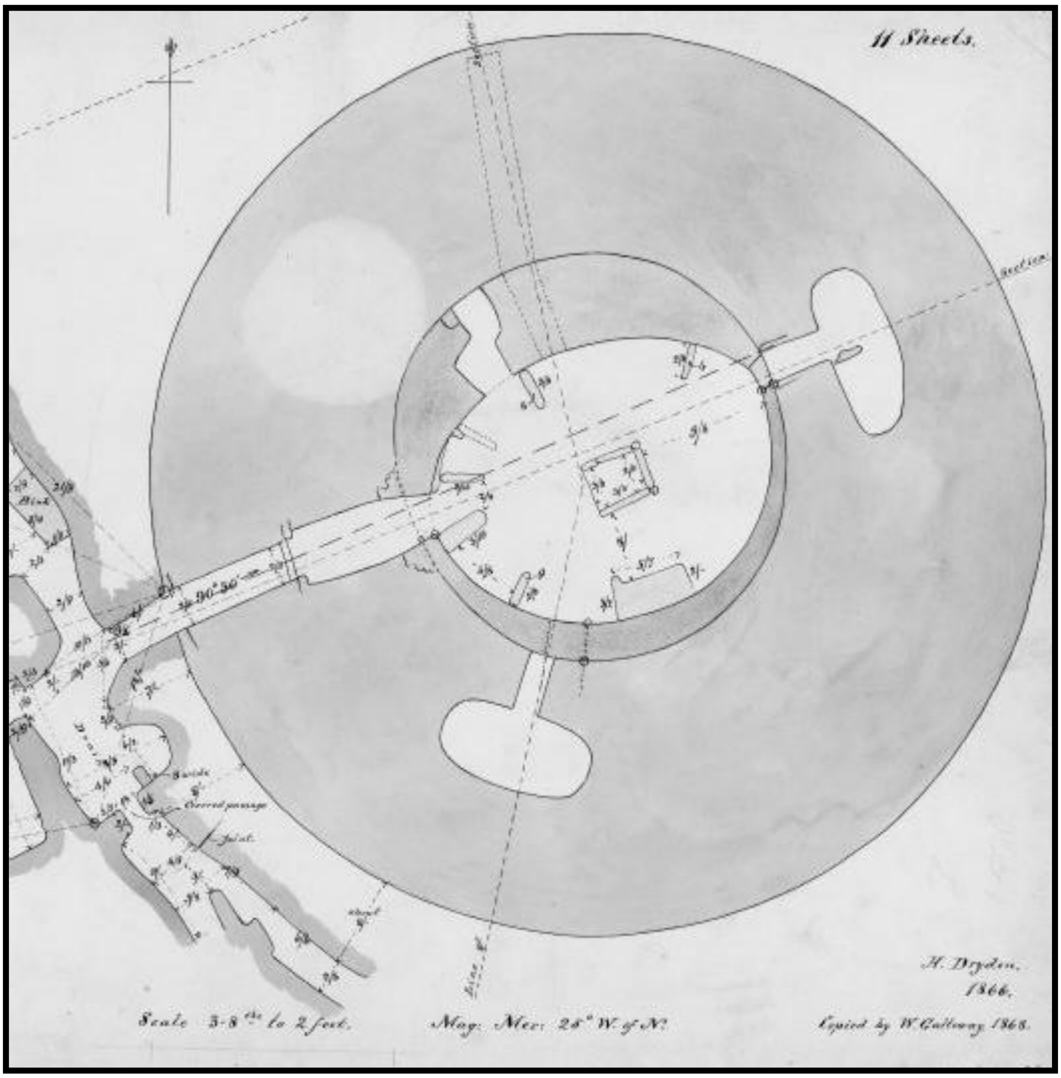


Figure 5.174. Multiple Viewsheds of Clickimin Broch.

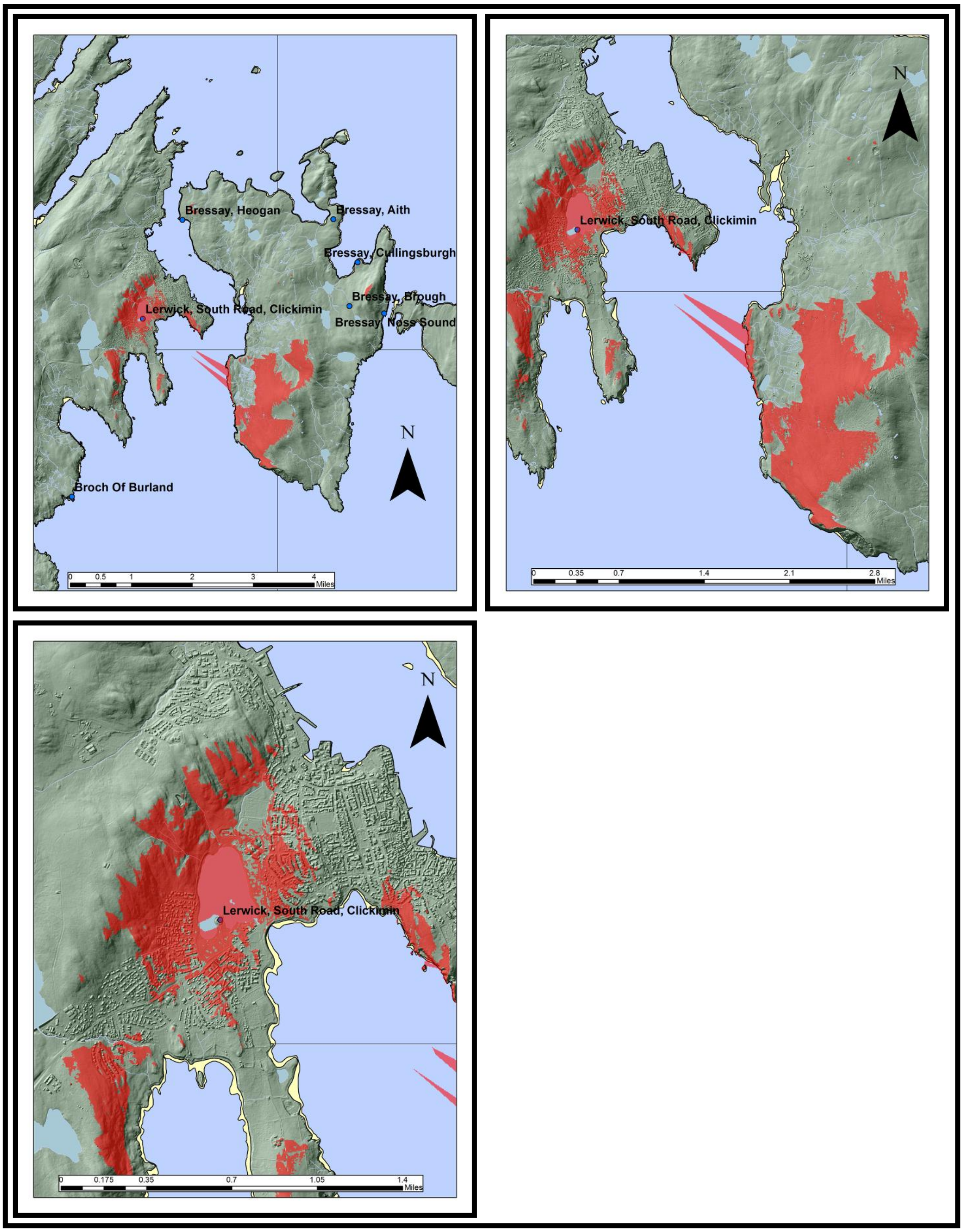


Figure 5.175. Sunrise (09:12:40 AM) to 14:15 PM around Clickimin on the Winter Solstice (21st December). Red areas denote areas of shadow.

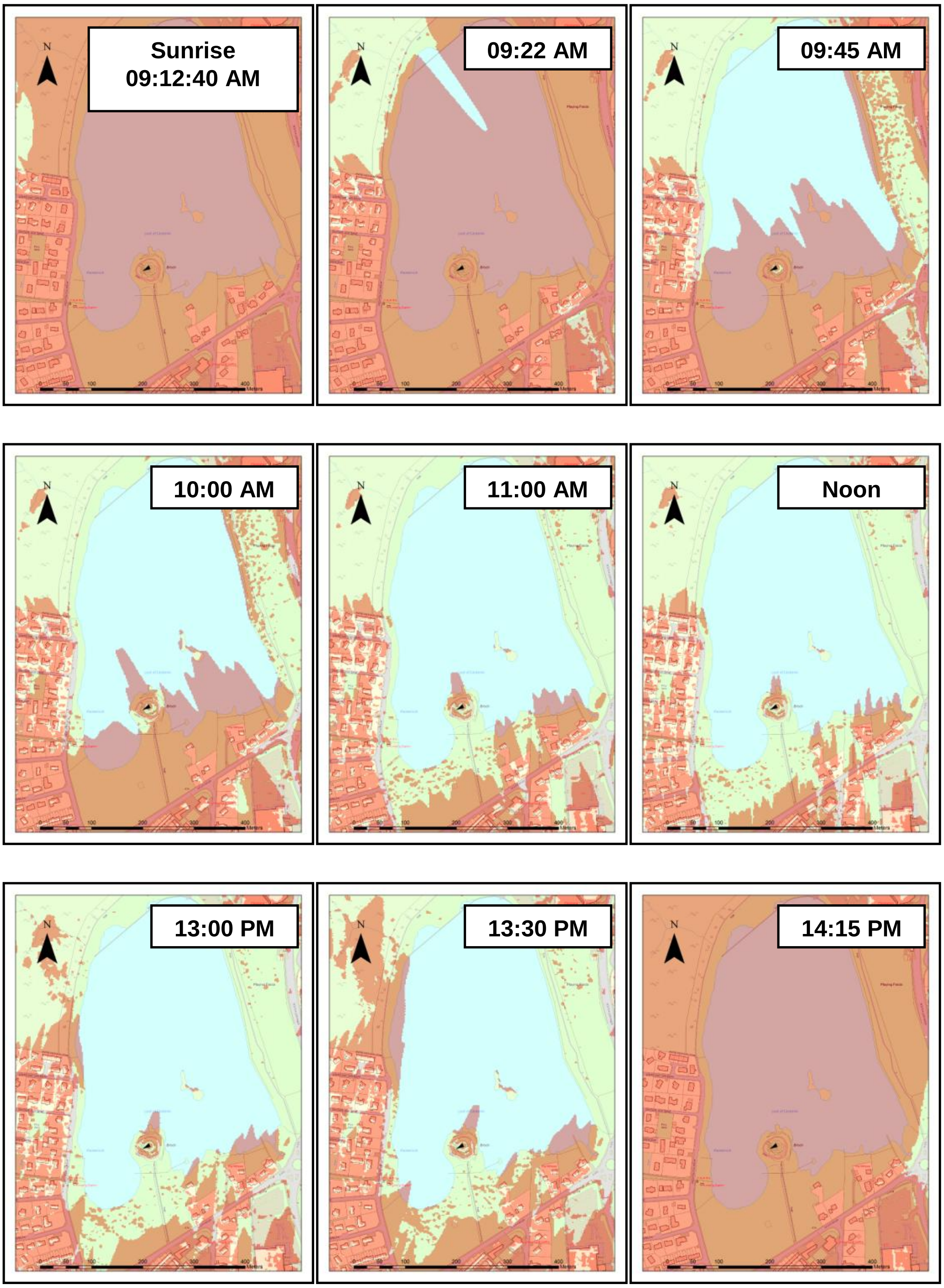


Figure 5.176. 14:45 PM to Sunset (14:53:10 PM) around Clickimin on the Winter Solstice (21st December). Red areas denote areas of shadow

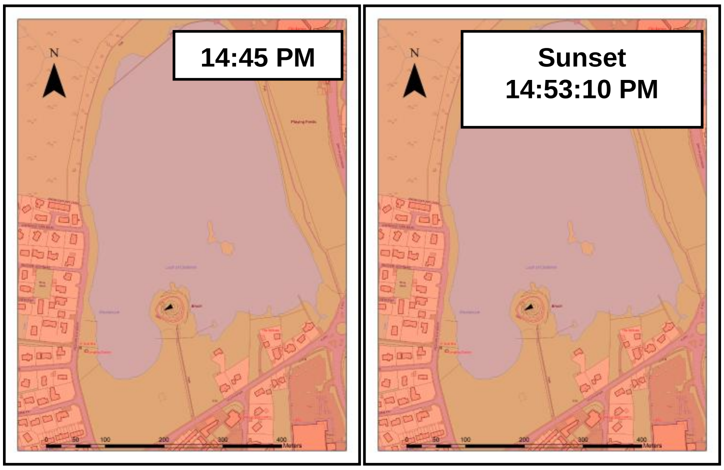


Figure 5.177. Sunrise (06:05:05 AM) to Noon around Clickimin on the Spring Equinox (21st March). Red areas denote areas of shadow.

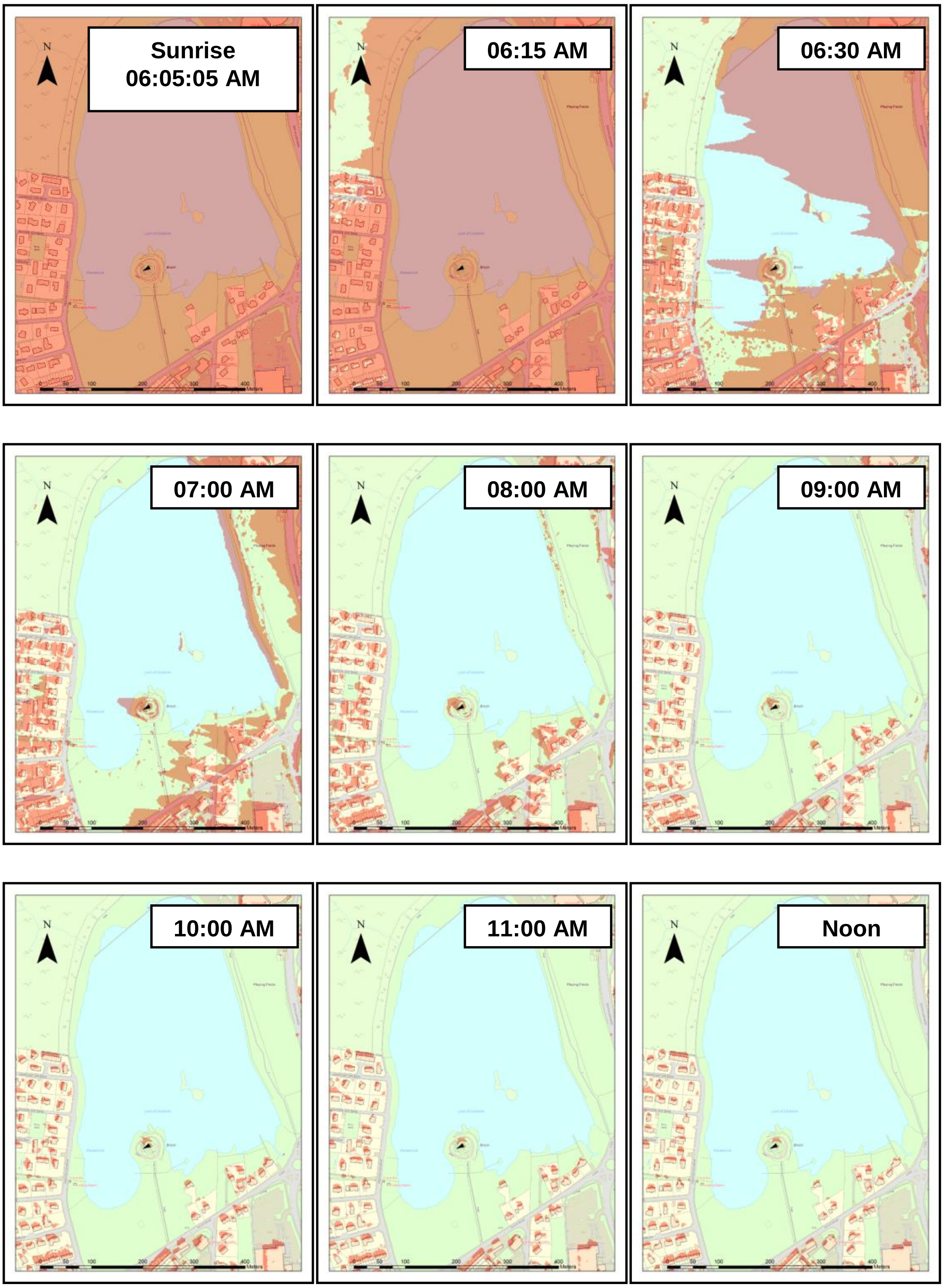


Figure 5.178. 13:00 PM to Sunset (18:19:55 PM) around Clickimin on the Spring Equinox (21st March). Red areas denote areas of shadow.

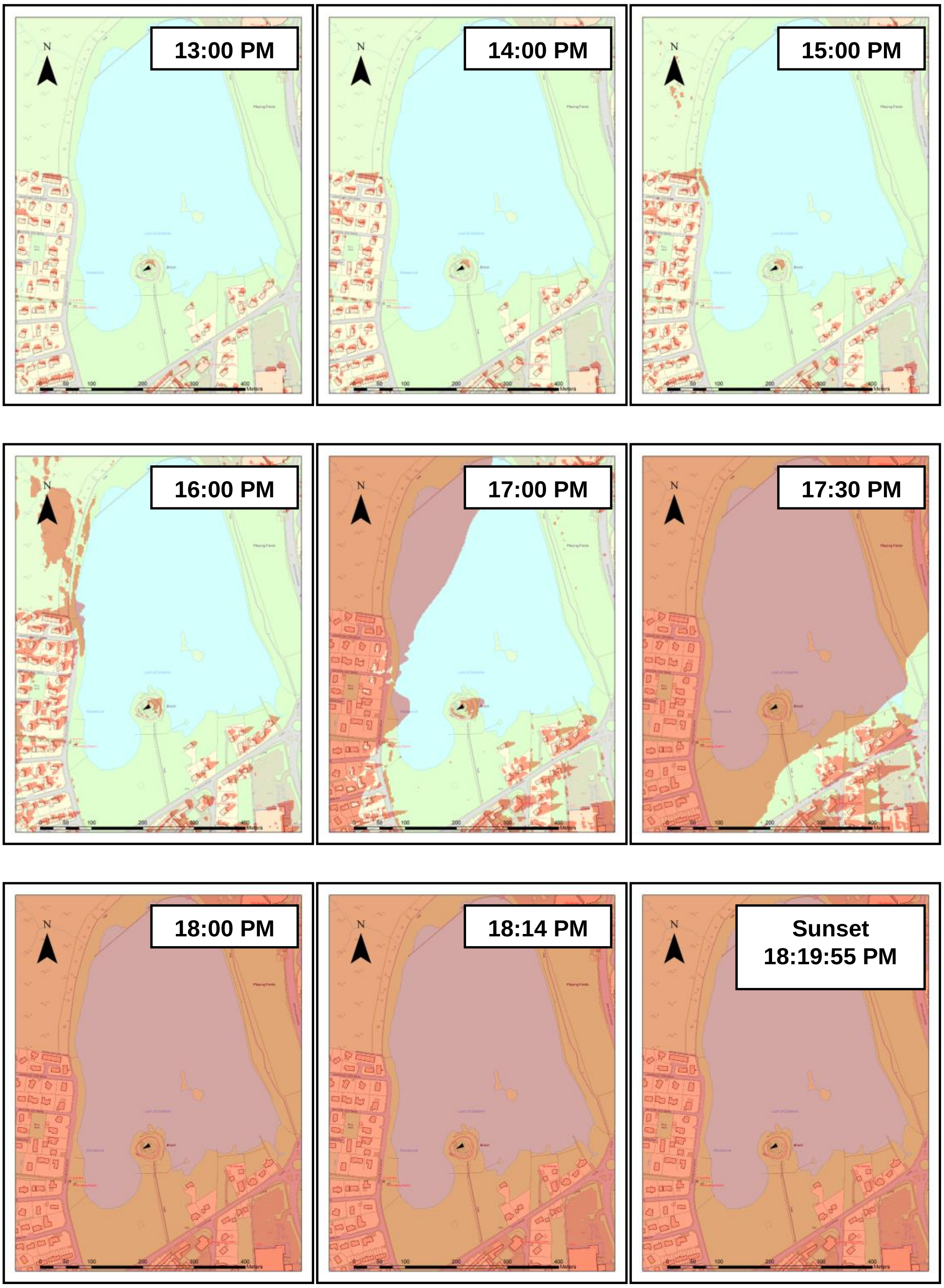


Figure 5.179. Sunrise (02:41:20 AM) to 09:00 AM around Clickimin on the Summer Solstice (21st June). Red areas denote areas of shadow.

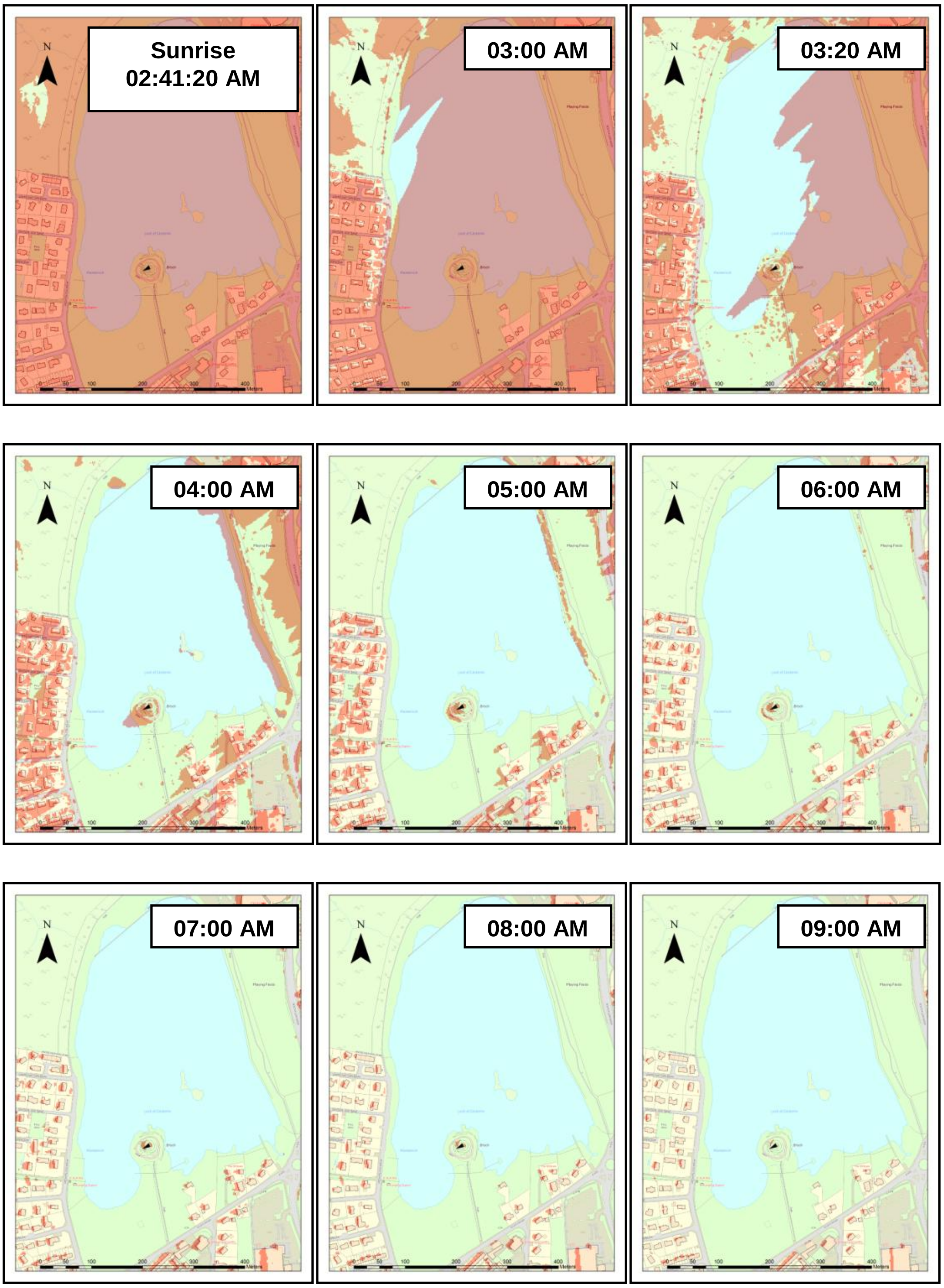


Figure 5.180. 10:00 AM to 18:00 PM around Clickimin on the Summer Solstice (21st June). Red areas denote areas of shadow.

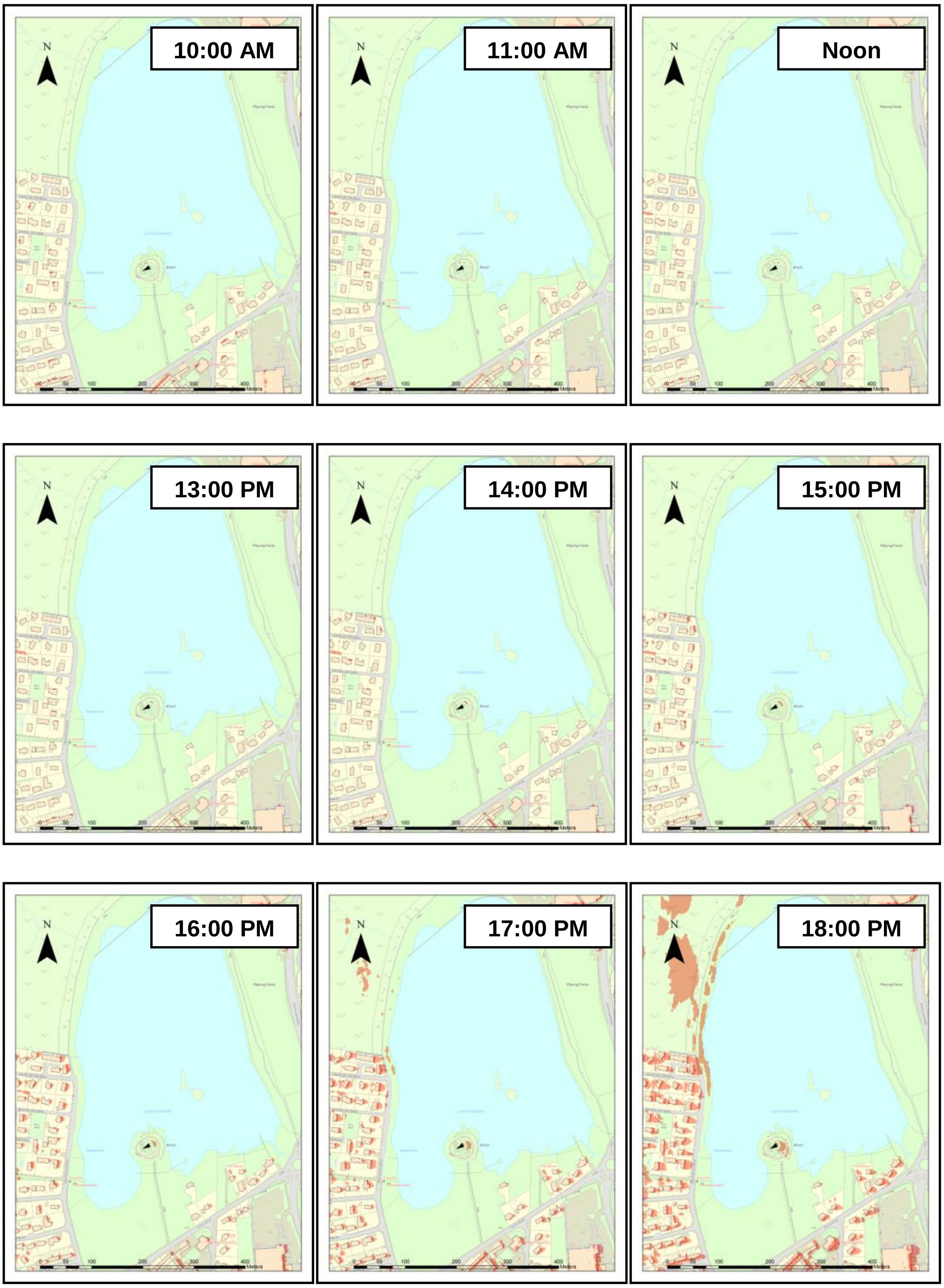
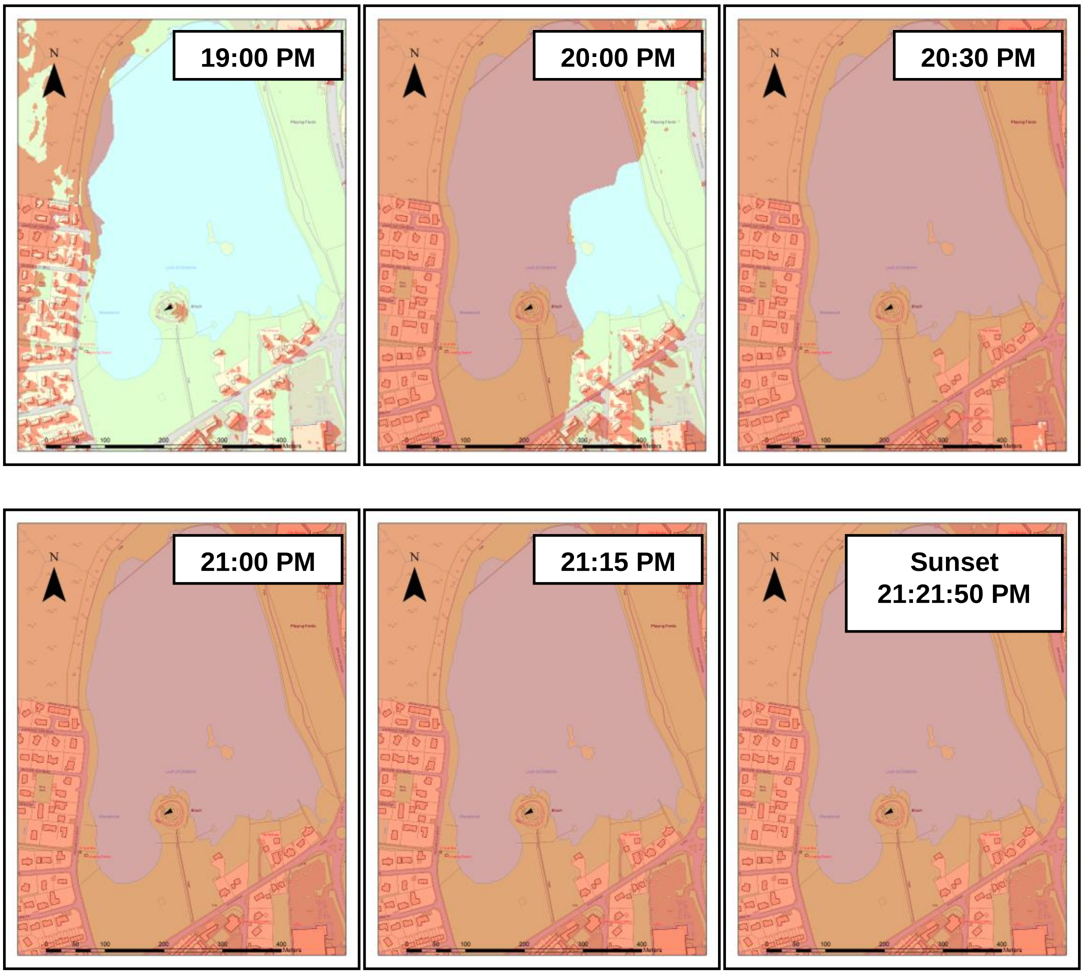


Figure 5.181. 19:00 PM to Sunset (21:21:50 PM) around Clickimin on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 17: Hoga Ness

Canmore ID: 50

Entrance: SW

The Broch and its Landscape Context

This unexcavated broch (also known as Belmont), is surrounded by extensive ditches on the landward arc (Hibbert 1822: 397) and is located at the end of a broad, flat, green turfed peninsular (Figure 5.182). It backs on to a steep, rocky shore, which is sheer in places, and forms cliffs about 20 ft. high. It is, in fact, very cleverly situated on the narrowest point of Bluemill Sound which separates Yell from Unst, and thus it possesses excellent views of this seaway (Figure 5.183), commanding at least two natural harbours on either side of the sound – Wick of North Garth on Yell, and Wick of Belmont on Unst. It also has a good view towards northern Yell, and has line-of-sight to one other broch there – Burgi Geo. To the south, it has views of the entrance to Bluemill Sound, and has good views down toward Feltar, having line-of-sight towards two other brochs there – Sna Brough and Brough Lodge. Again, this suggests a maritime focus.

The Winter Solstice (21st December) – Figures 5.184 and 5.185

With its entrance located on the SW side of the broch, this structure is well suited to the winter months. The broch and much of its immediate landscape gains sunlight within the first fifteen minutes after sunrise, and retains it for much of the day. As sunlight withdraws, at about 14:00 PM, the broch's SW entrance loses light between fifteen and twenty minutes before sunset. An entrance towards the either the SE or SW is beneficial for this time of year then, but there is little difference with regards to light availability between either a SW and a SE entrance, though a SE entrance would have faced away from the prevailing winds at least.

The Equinox (21st March) – Figures 5.186 and 5.187

During the equinoxes, the broch's eastern side gains light about forty minutes after sunrise. The broch and its landscape then retain light for much of the day, until about 17:30 PM, when the sun begins to descend. Between 17:30 PM and 18:00 PM, the broch and its immediate landscape fall into the shade, between thirty and forty minutes before sunset. For the equinoxes then, a western entrance would have been only slightly more beneficial than an eastern. The fact that the broch loses this late afternoon sun, may also be the reason why it is orientated towards the SW rather than due W, as the sun sets in the W during spring and autumn, and this is lost here. This also suggests that the location was more important than its ability to acquire light.

The Summer Solstice (21st June) Figures 5.188, 5.189 and 5.190

The eastern side of the broch gains light probably just after 03:00 AM, about forty minutes after sunrise. The broch and its immediate landscape retain it for much of the day. It is not until 20:30 that the broch and its landscape begin to fall into the shade again. The western side of the site loses light between 21:15 PM and 21:30 PM, at most only twenty minutes before sunset. For the summer then, the west retains slightly more light than the east would have, even though the SW entrance would have gained little direct light due to the height of the sun in the south-west during the summer.

Conclusion

This broch seems well orientated for the winter months especially, choosing not to select a due west or eastern entrance, which loses some light during the spring and autumn equinoxes. It is interesting that this broch faces SW however, not only facing into the prevailing winds, but also facing directly away from the NE approach to the site.

Figure 5.182. Ground Plan of Hoga Ness. (Crown Copyright: RCAHMS).

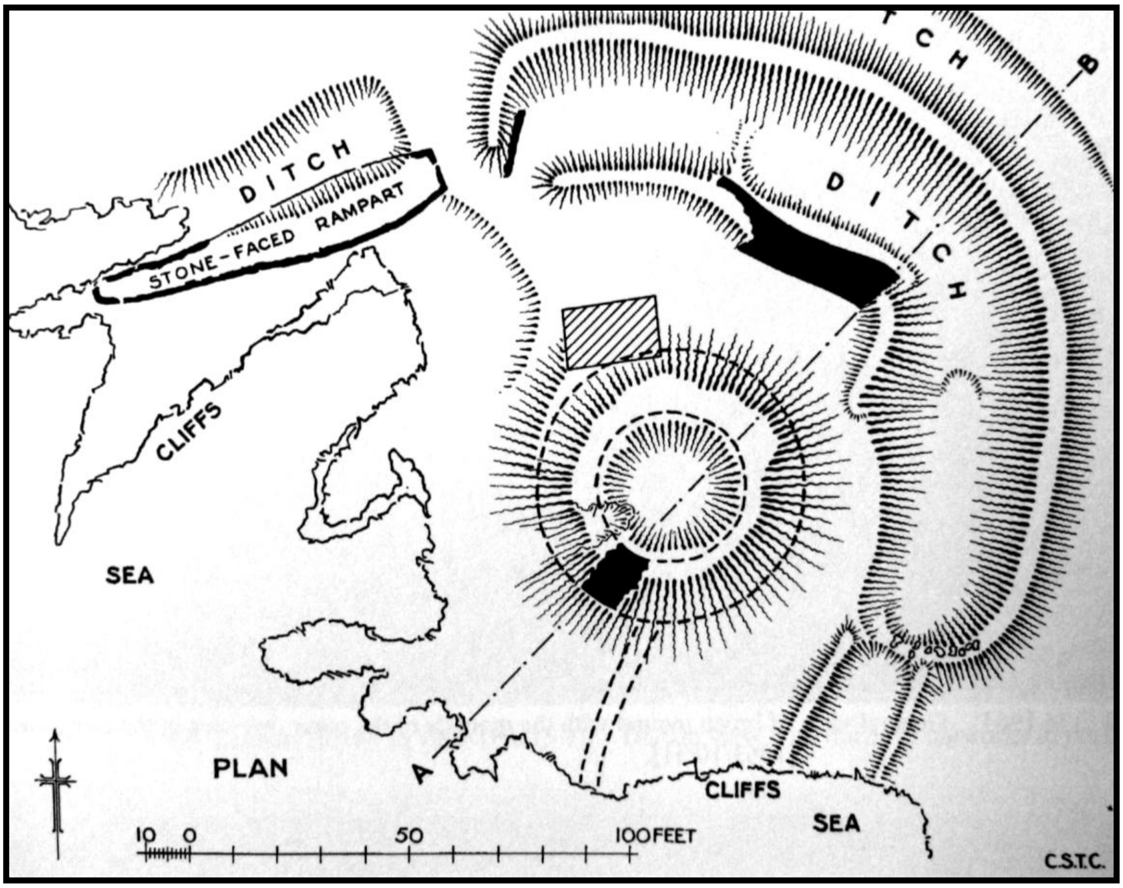


Figure 5.183. Multiple Viewsheds of Hoga Ness Broch.

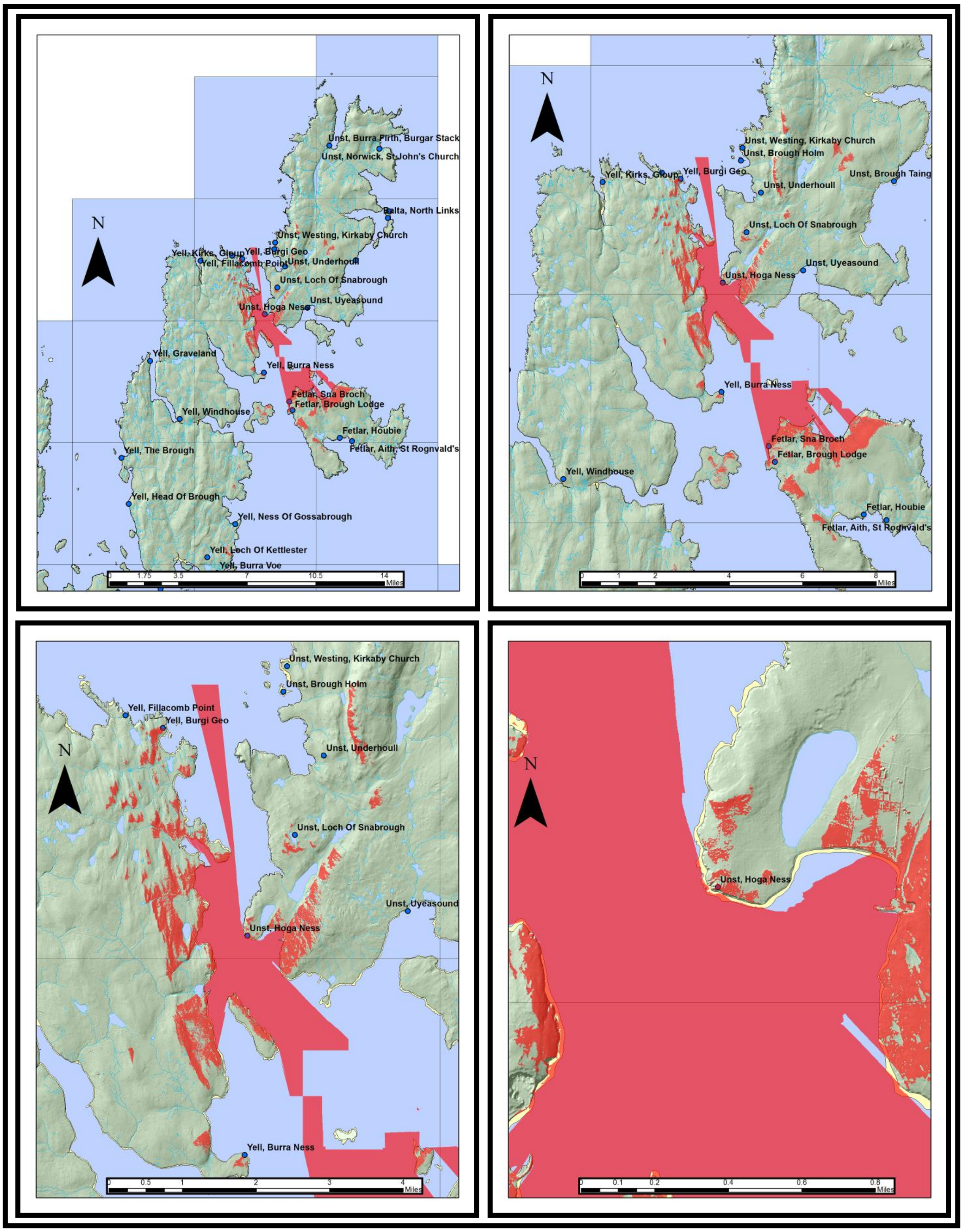


Figure 5.184. Sunrise (09:16 AM) to 14:00 PM around Hoga Ness on the Winter Solstice (21st December). Red areas denote areas of shadow.

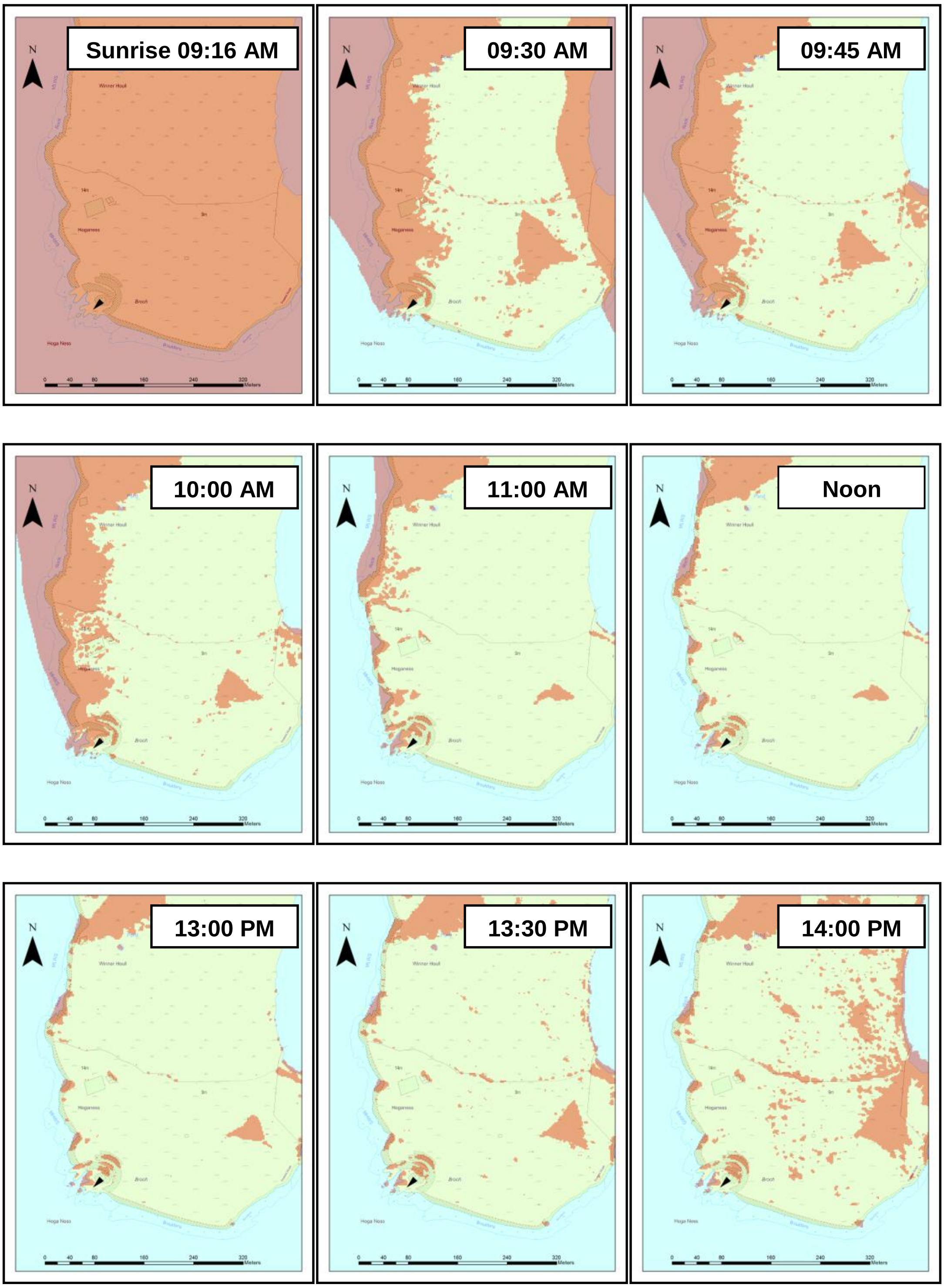


Figure 5.185. 14:15 PM to Sunset (14:49:40 PM) around Hoga Ness on the Winter Solstice (21st December). Red areas denote areas of shadow.

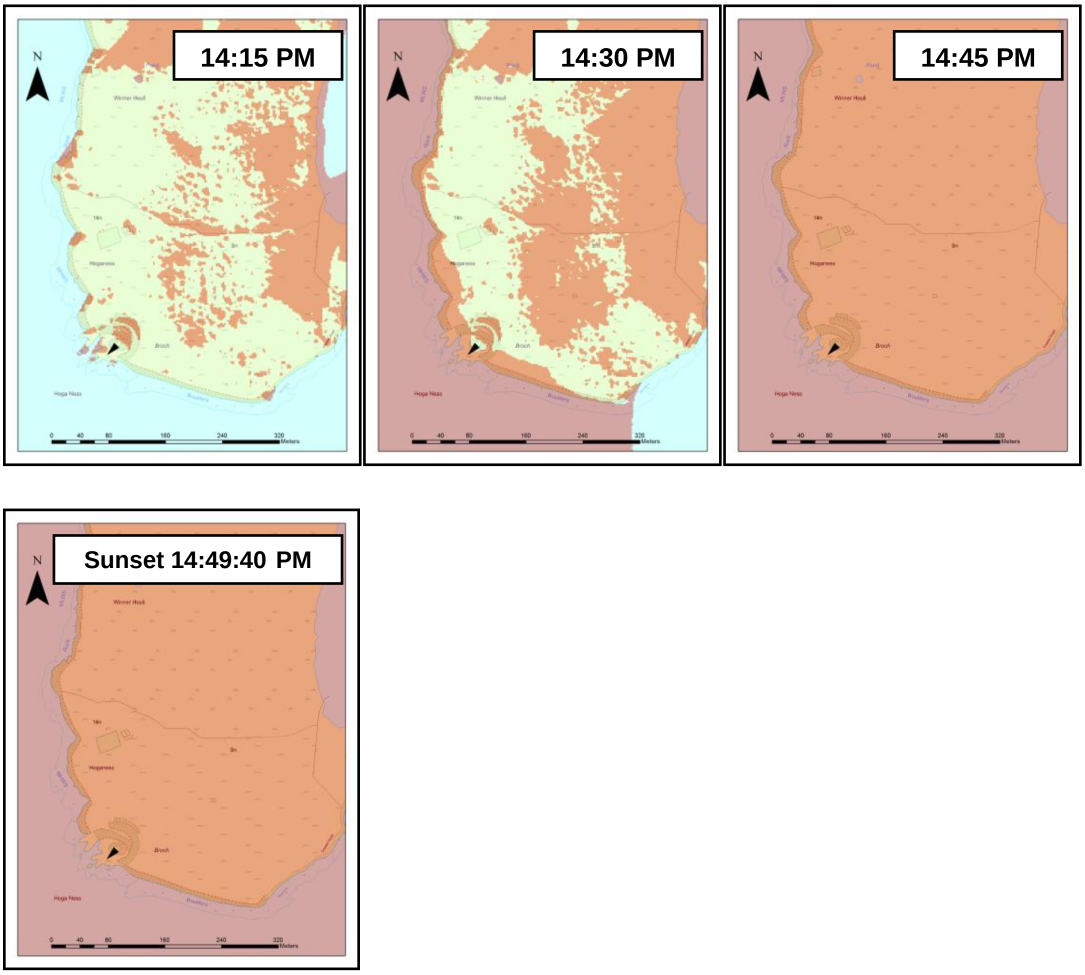


Figure 5.186. Sunrise (06:04:45 AM) to Noon around Hoga Ness on the Spring Equinox (21st March). Red areas denote areas of shadow.

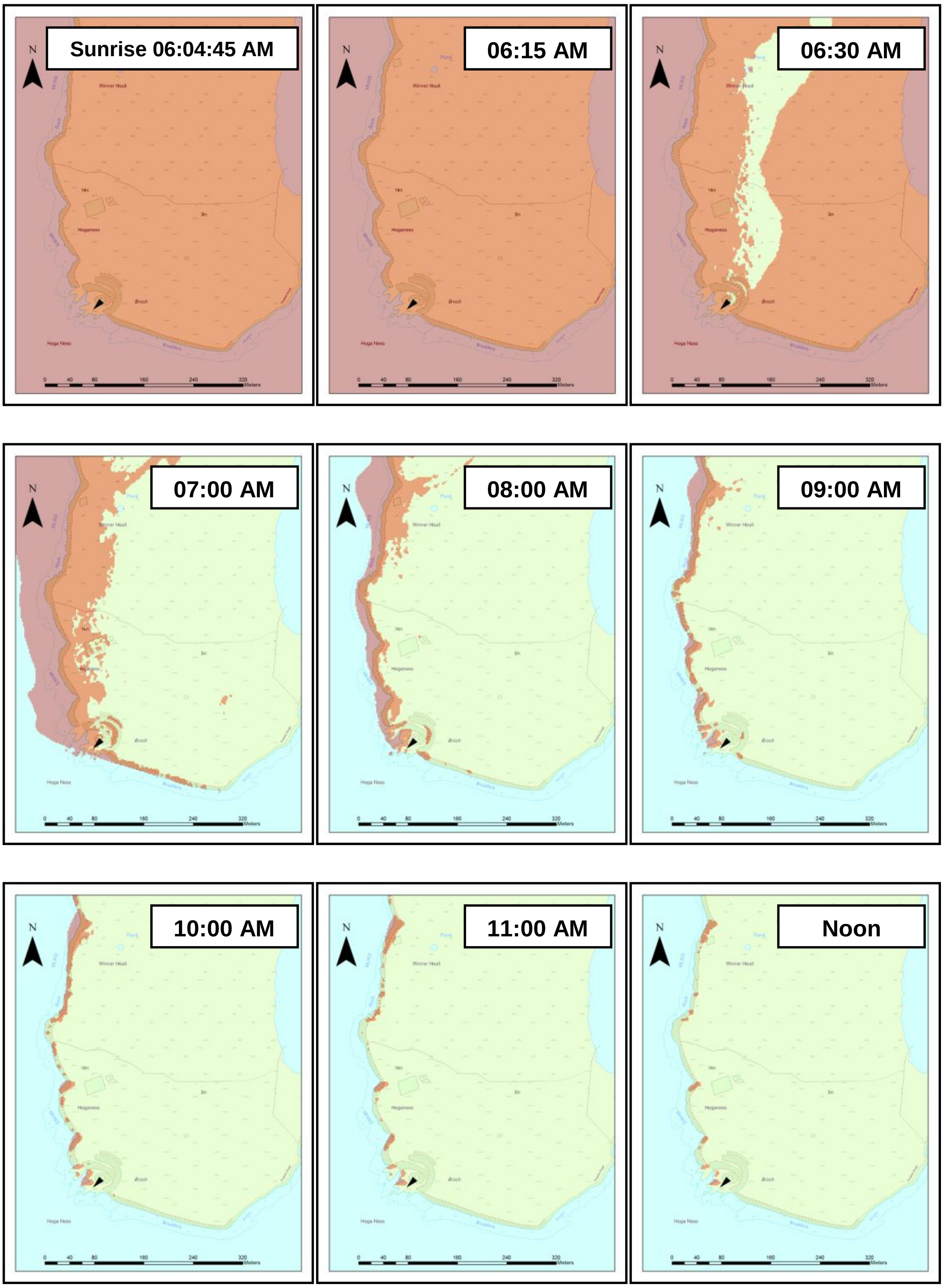


Figure 5.187. 13:00 PM to Sunset (18:19:45 PM) around Hoga Ness on the Spring Equinox (21st March). Red areas denote areas of shadow.

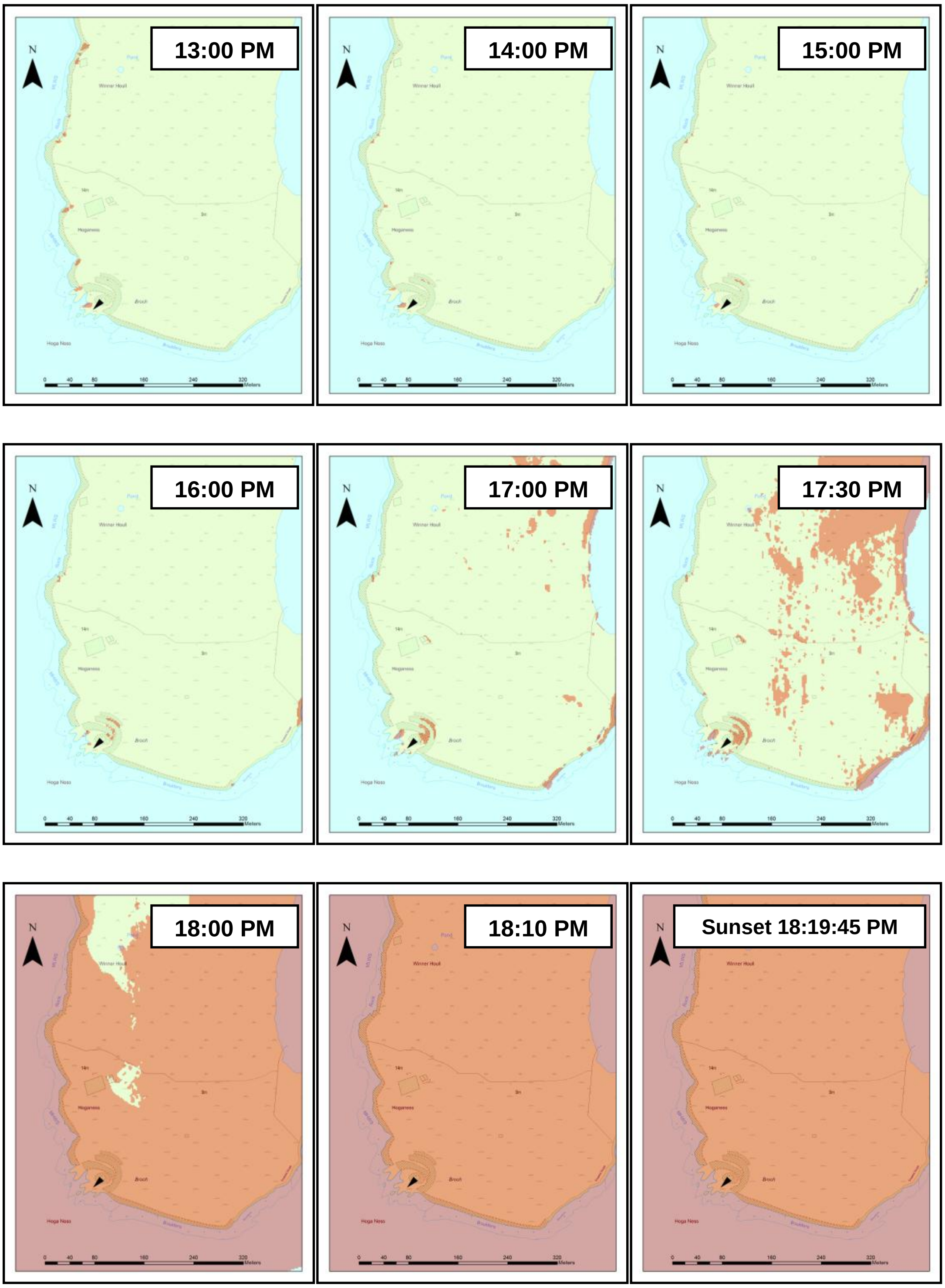


Figure 5.188. Sunrise (02:36:50 AM) to 08:00 AM around Hoga Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.

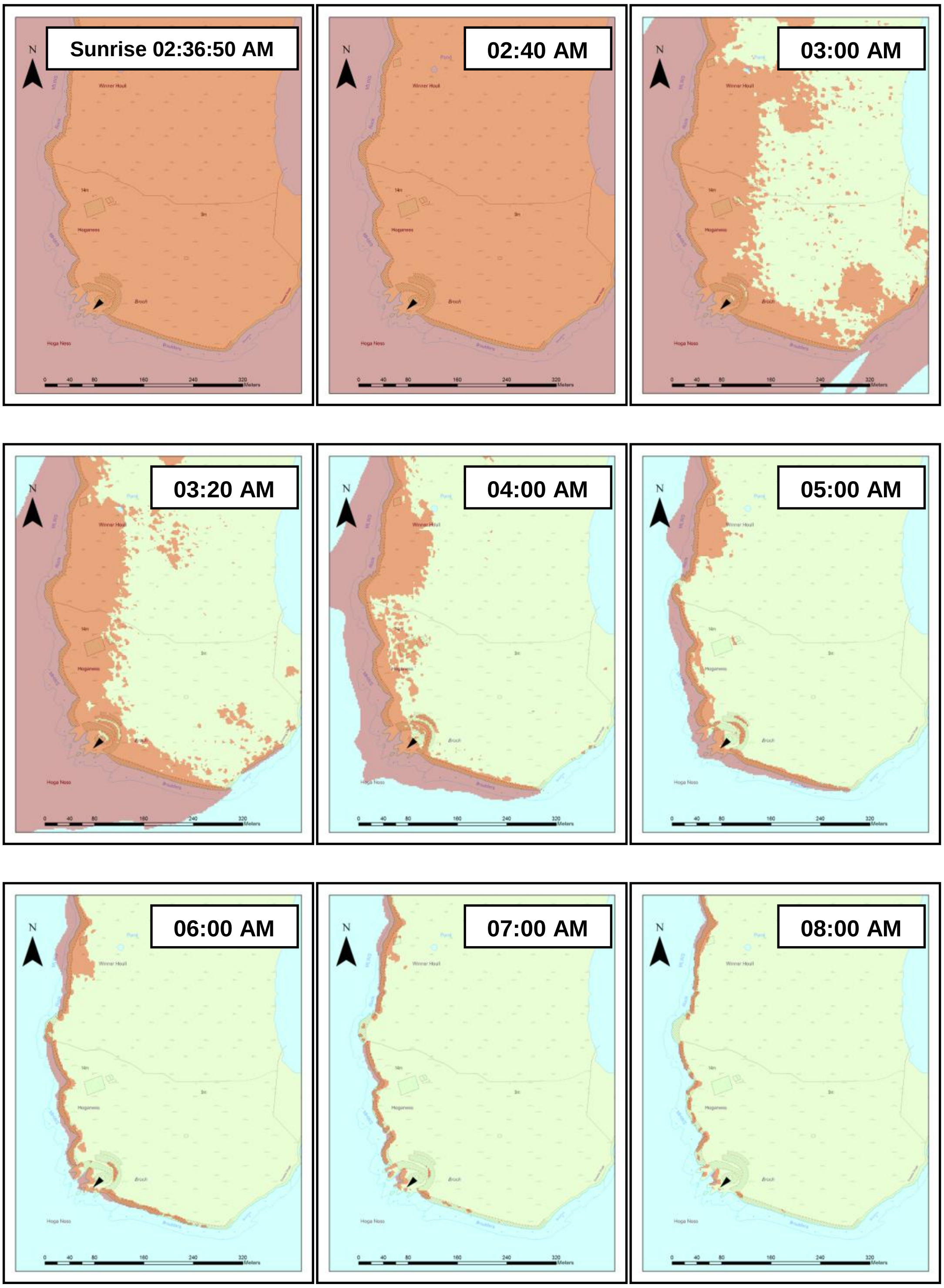


Figure 5.189. 09:00 AM to 17:00 PM around Hoga Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.

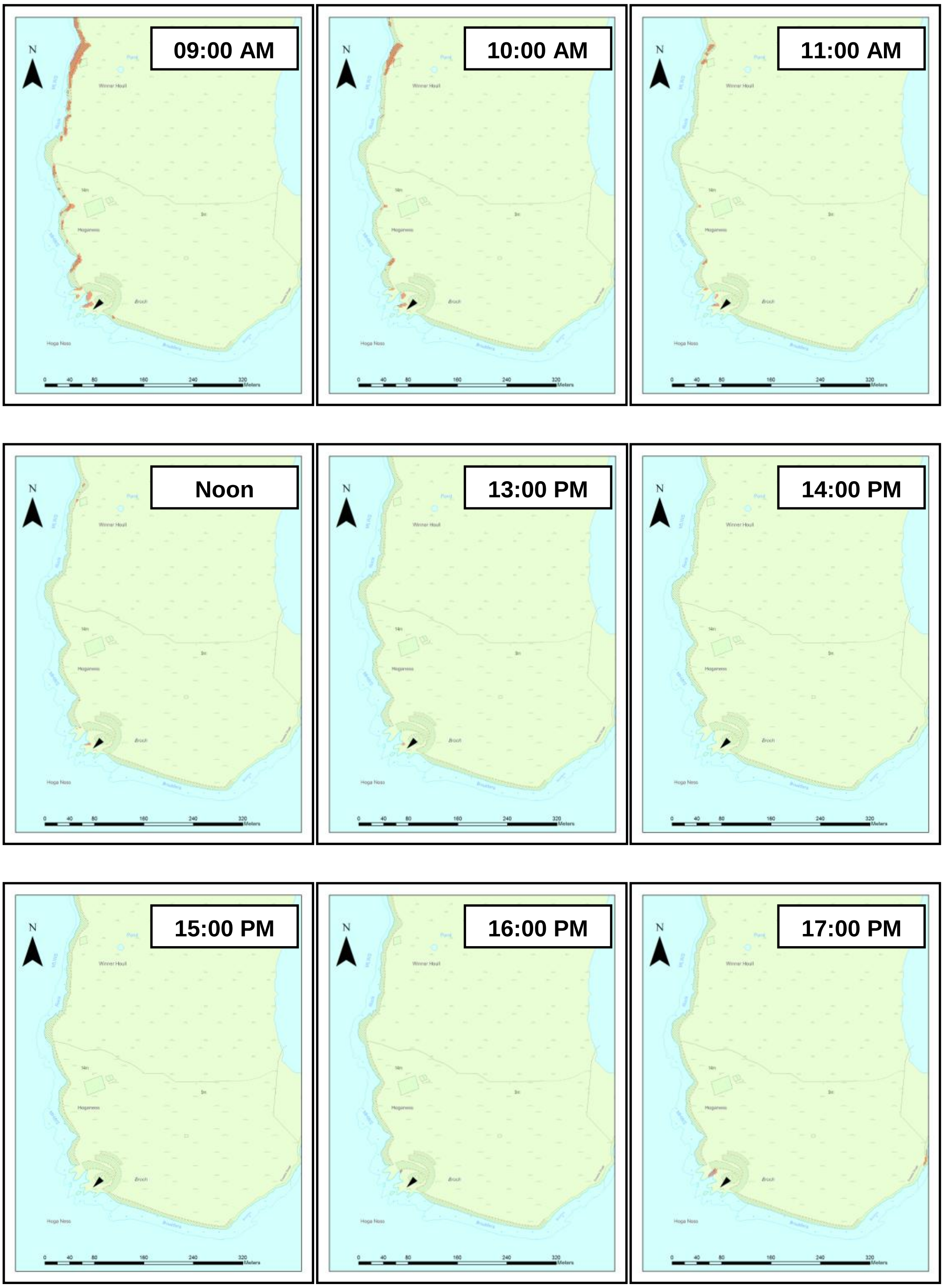
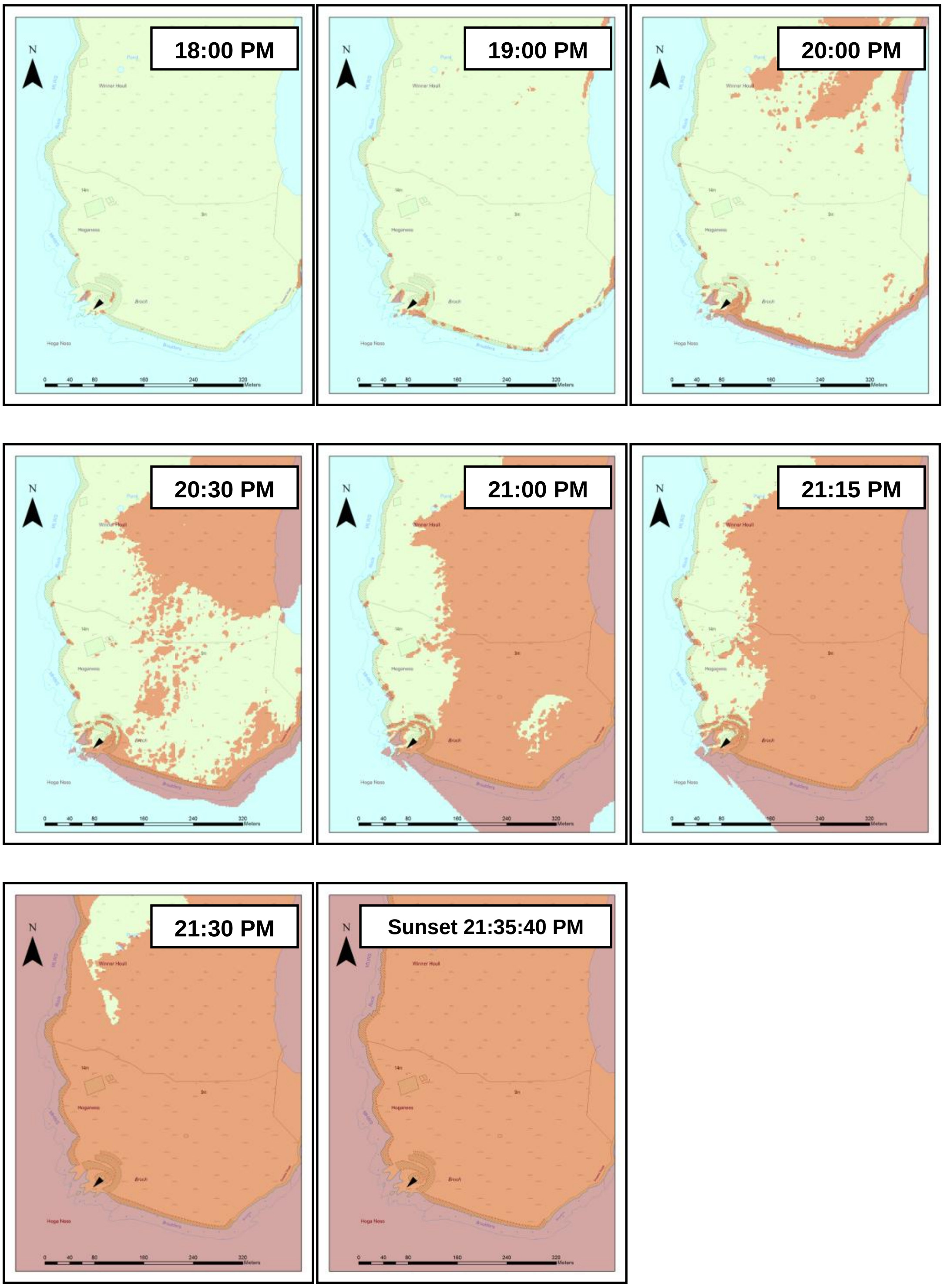


Figure 5.190. 18:00 PM to Sunset (21:35:40 PM) around Hoga Ness on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 18: Underhoull

Canmore ID: 31

Entrance: SW

The Broch and its Landscape Context

This partially excavated broch (Small 1962; see Figure 5.191) stands on the edge of a ridge which slopes down with increasing shallowness. Commanding the bay of Lunda Wick (Figure 5.192), it has good views out towards the northern entrance of Blue Mill Sound which separates Unst and Yell, and so again, the sea seems to be the object of attention. However, this broch also possesses excellent views of Yell, and has a long range view down the west coast of the northern Mainland too. Unlike other sites already noted, it has line-of-site towards other brochs, including Burgi Geo, Loch of Snabrough, Brough Holm and Kirkaby Church.

The Winter Solstice (21st December) – Figures 5.193 and 5.194

With an entrance in the SW, this site is well suited to the winter months. Within the first fifteen minutes after sunrise, the broch gains direct sunlight on its SE side. During the next couple of hours, the landscape around it is also brought into direct light. Between noon and 13:00 PM, the SE entrance would have gained light and retained it until 14:45 PM at least, probably losing light only a minute or two before sunset. This orientation thus gains the maximal amount of light for this particular location, gaining more light than an eastern entrance would, despite facing the prevailing winds.

The Equinox (21st March) – Figures 5.195 and 5.196

For spring and autumn, the broch gains light within the first twenty to twenty-five minutes after sunrise. The immediate landscape is then illuminated by 08:00 AM, and remains in direct light for much of the day. Like in winter, the broch retains direct sunlight until moments before sunset, losing light probably only a few minutes before the sun actually sets. And so again, the western entrance gains more light than an eastern entrance would have.

The Summer Solstice (21st June) Figures 5.197, 5.198 and 5.199

Unlike the rest of the year, the broch does not gain light for over an hour during the midsummer period. When it does, around 04:00 AM, it retains it for the day, and by 05:00 AM, the broch and much of the immediate landscape are in direct sunlight. Interestingly, when the landscape begins to fall into shadow after about 20:30 PM, the broch on the higher ground retains light until sunset itself. A western entrance is thus more beneficial than an eastern for this site in the summer too.

Conclusion

The broch's SW entrance gains maximal light during the winter months, suggesting its importance during this period of the year, though a western entrance would have been as equally well suited throughout the year. Furthermore, unlike many brochs in Shetland, this site retains light until sunset itself, and this is especially true with regards to the summer period. Though the SW entrance would not have gained much light during this time of the year, this is still interesting with regards to the surrounding ditch and its apparent NW entrance. It could be suggested that, like the dun houses and enclosures which we see in Argyll (Crowther 2011), the summer solstice was marked in this functionally irrelevant orientation choice. Its secondary entrance/exit, notable on the SE side of the ditch, also receives some of the first light during the midwinter sunrise. It could be that the rising sun of the midwinter and the setting sun of the midsummer – both potentially significant with regards to themes of change and renewal – were being marked by the inhabitants of this broch structure, while they orientated the domestic structure towards the functionally (and symbolically) significant orientation of the SW.

Figure 5.191. Plan of Underhoull.
(After: RCAHMS 1946)

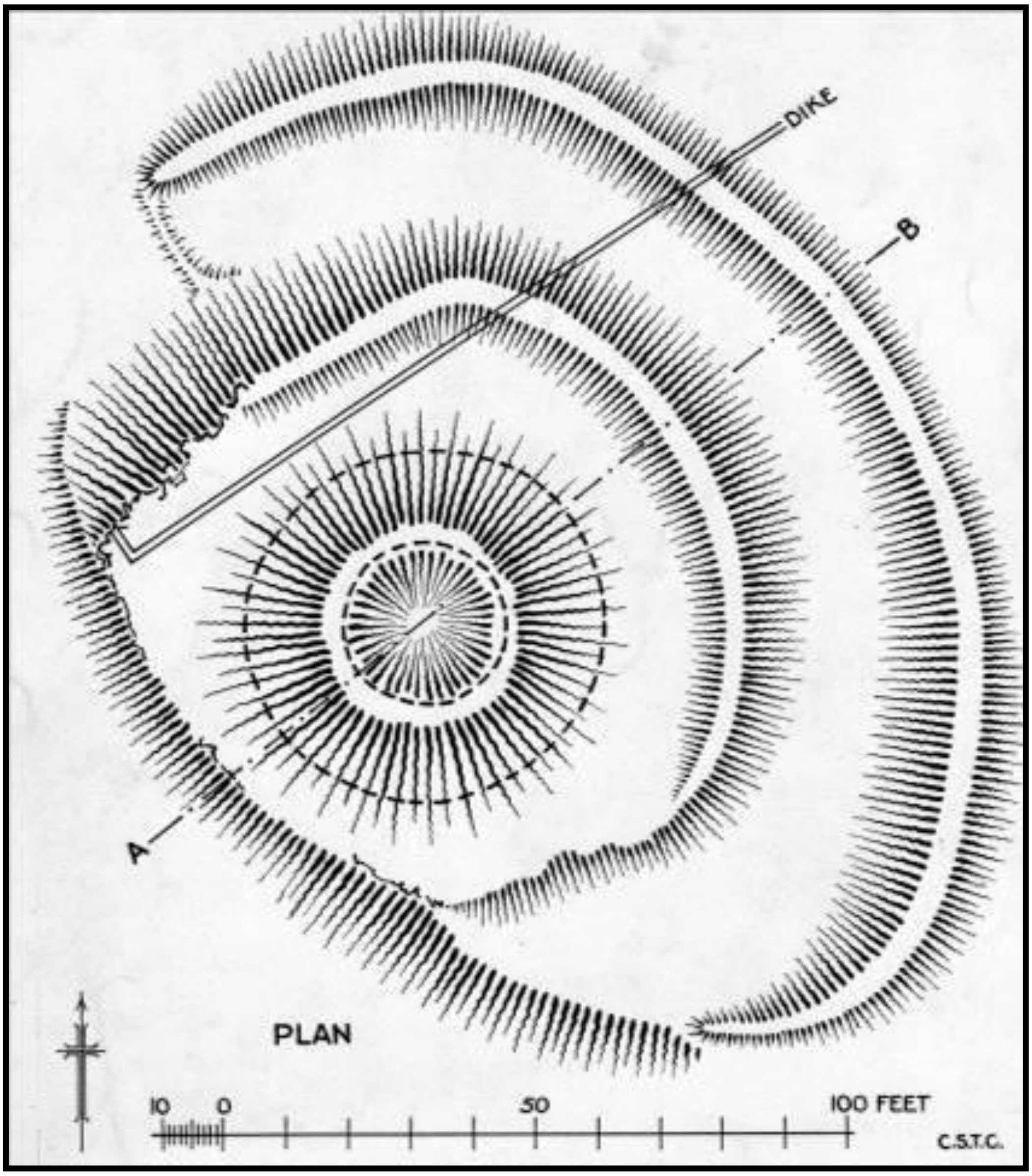


Figure 5.192. Multiple Viewsheds of Underhoull Broch.

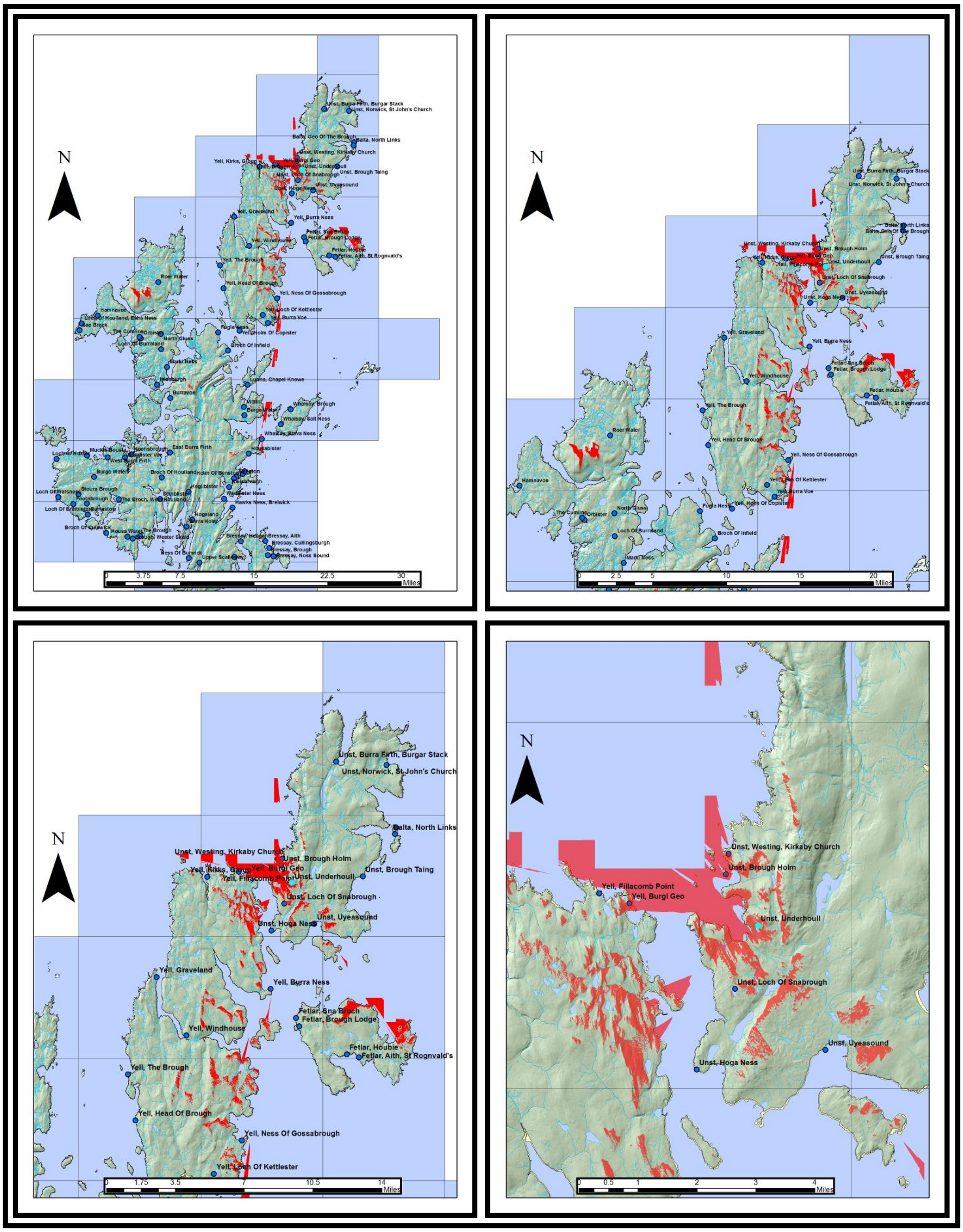


Figure 5.193. Sunrise (09:15 AM) to 14:00 PM around Underhoull on the Winter Solstice (21st December). Red areas denote areas of shadow.

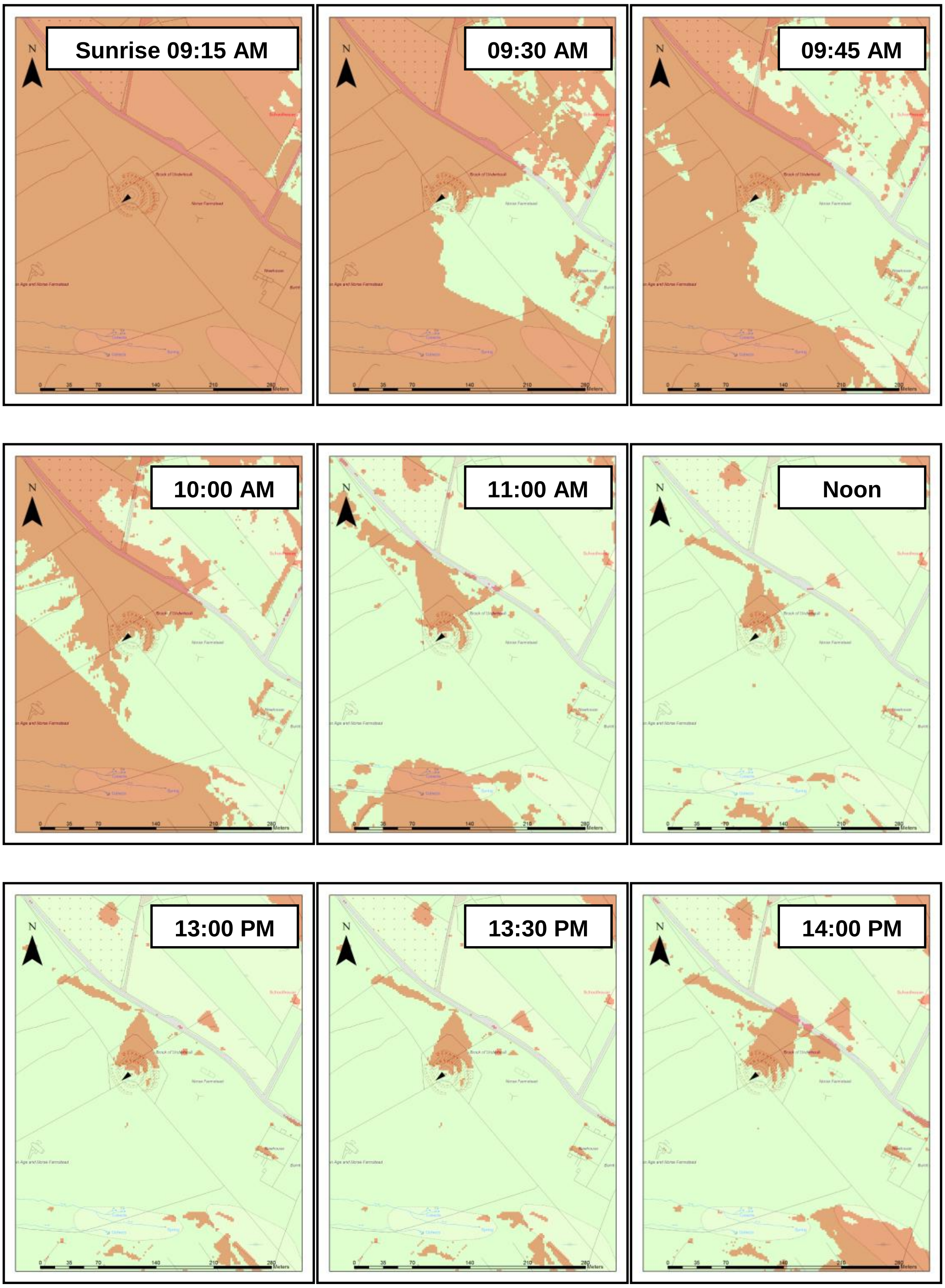


Figure 5.194. 14:15 PM to Sunset (14:49:50 PM) around Underhoull on the Winter Solstice (21st December). Red areas denote areas of shadow.

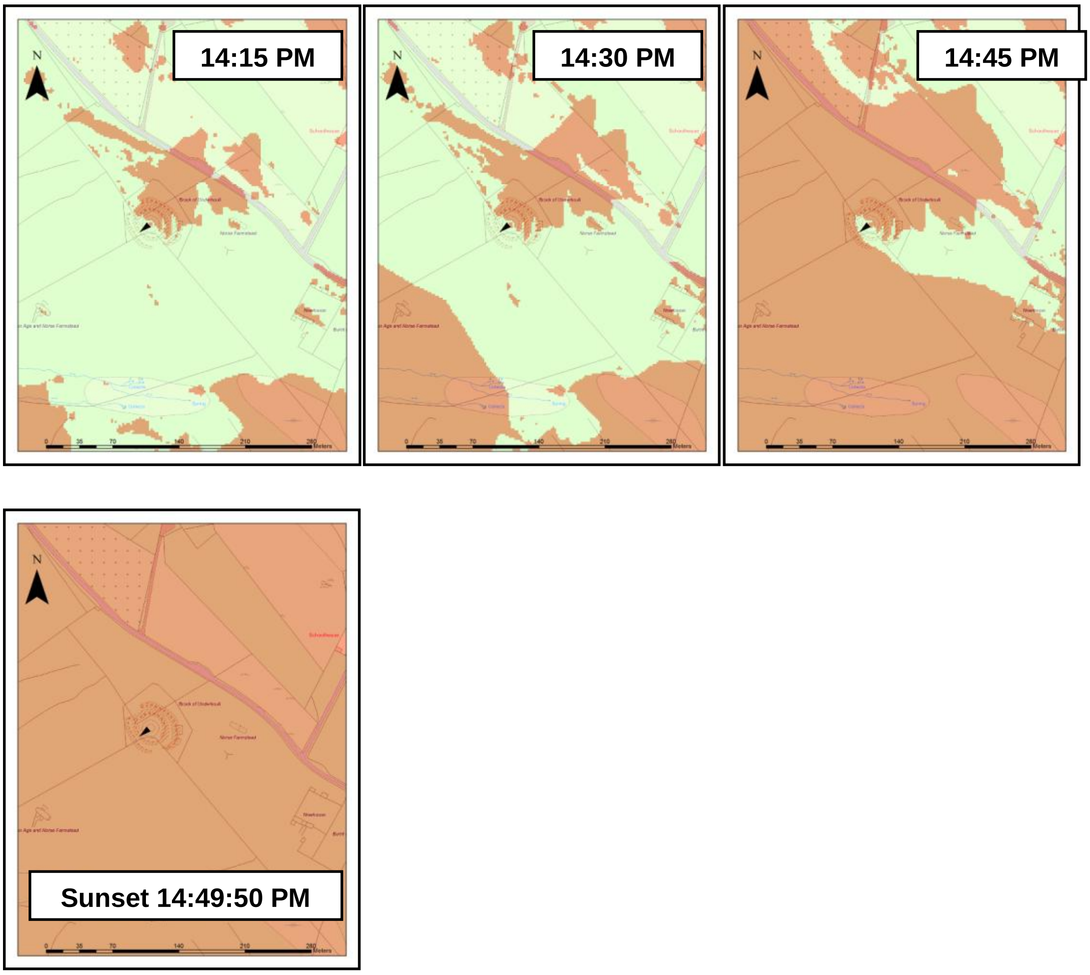


Figure 5.195. Sunrise (06:04:45 AM) to Noon around Underhoull on the Spring Equinox (21st March). Red areas denote areas of shadow.

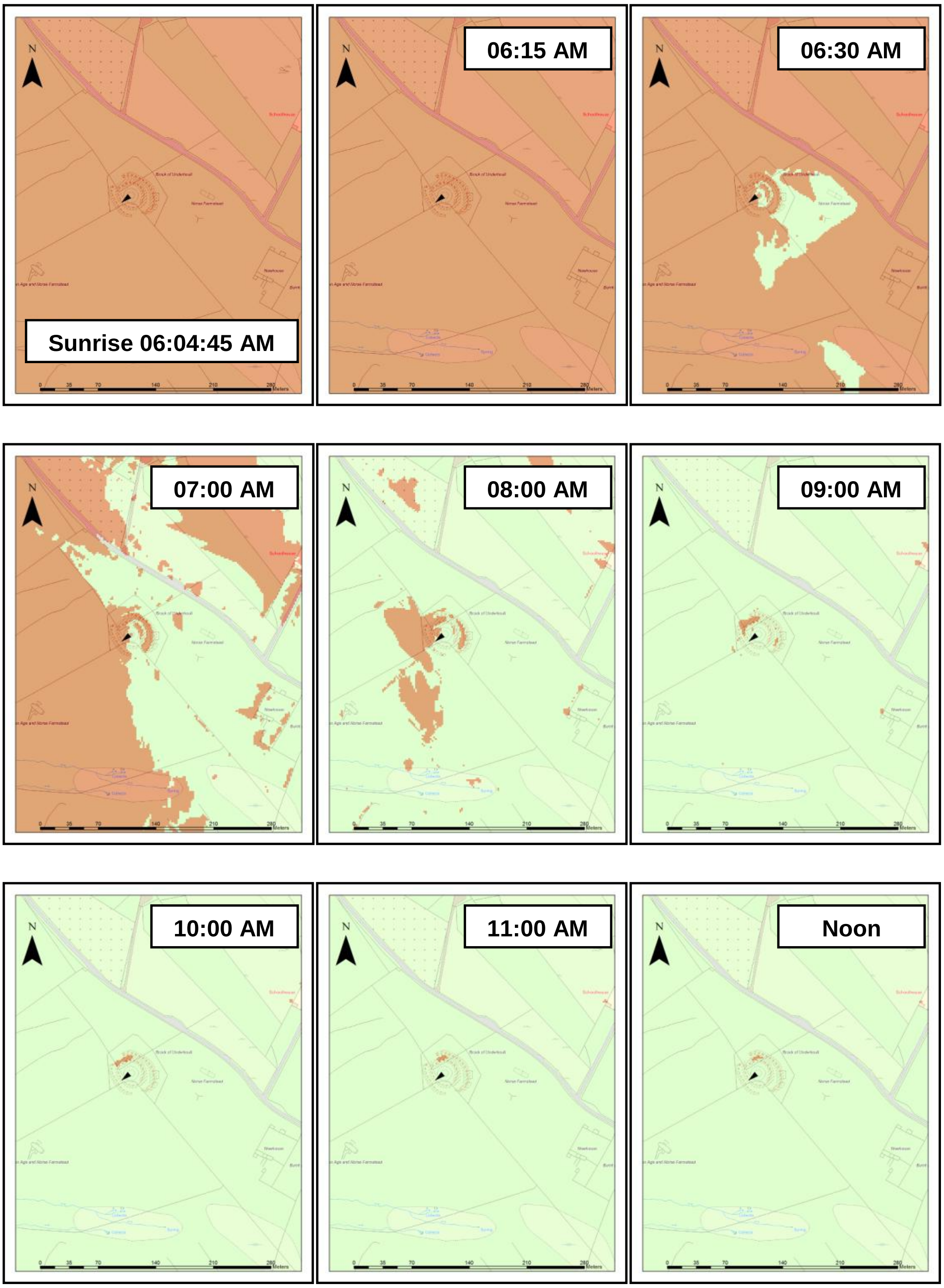


Figure 5.196. 13:00 PM to Sunset (18:19:45 PM) around Underhoull on the Spring Equinox (21st March). Red areas denote areas of shadow.

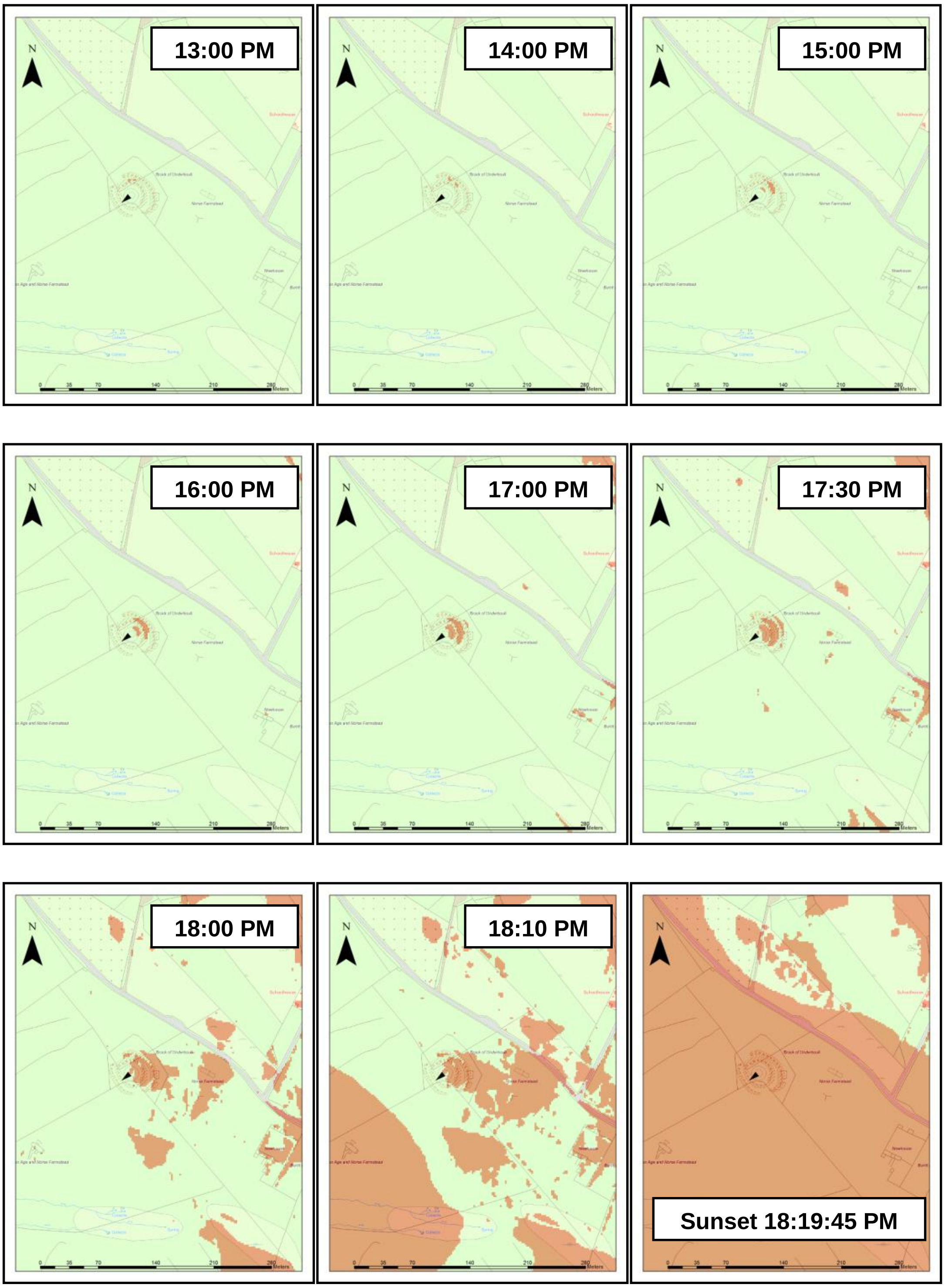


Figure 5.197. Sunrise (02:36:50 AM) to 08:00 AM around Underhoull on the Summer Solstice (21st June). Red areas denote areas of shadow.

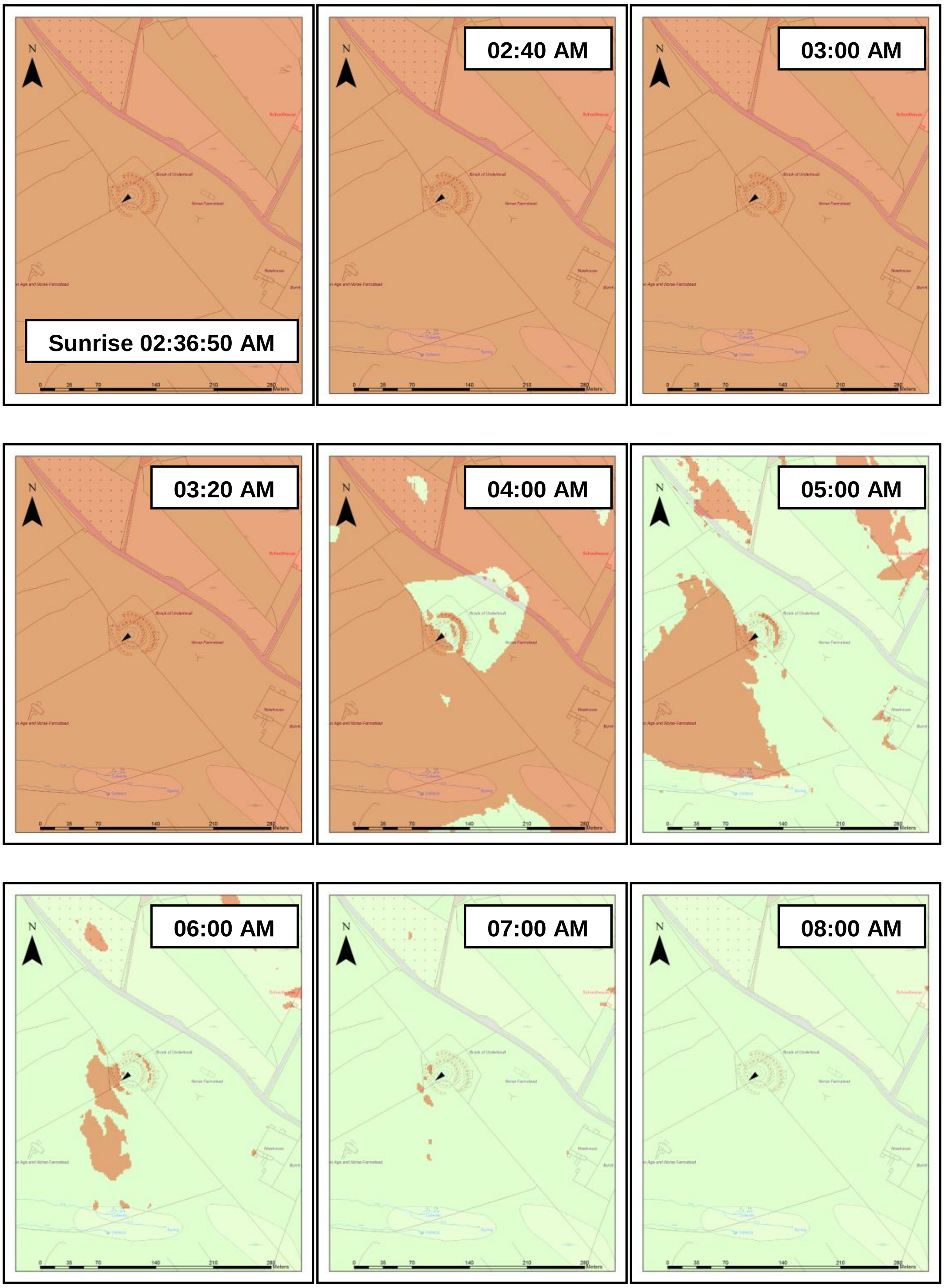


Figure 5.198. 09:00 AM to 17:00 PM around Underhoull on the Summer Solstice (21st June). Red areas denote areas of shadow.

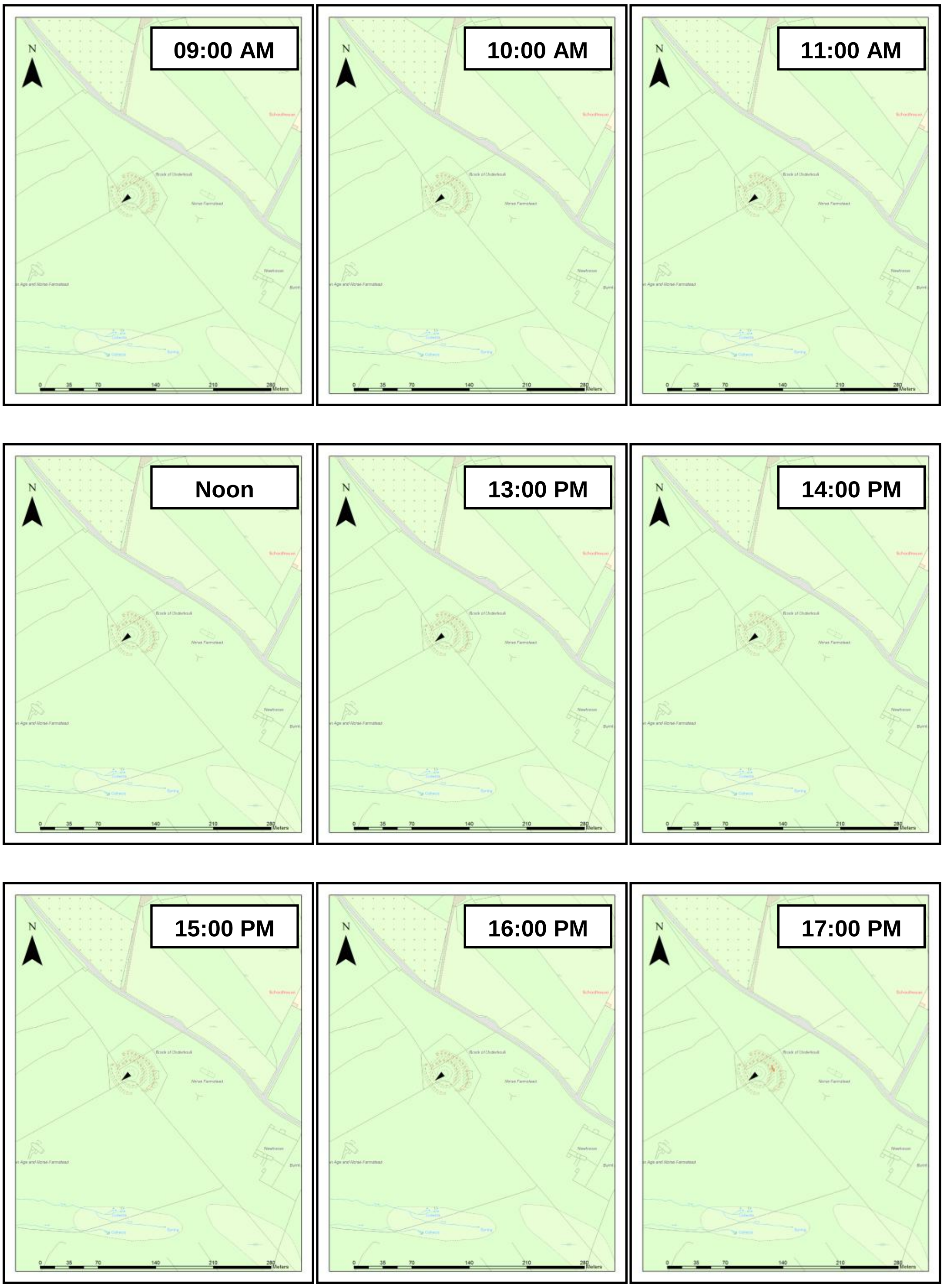
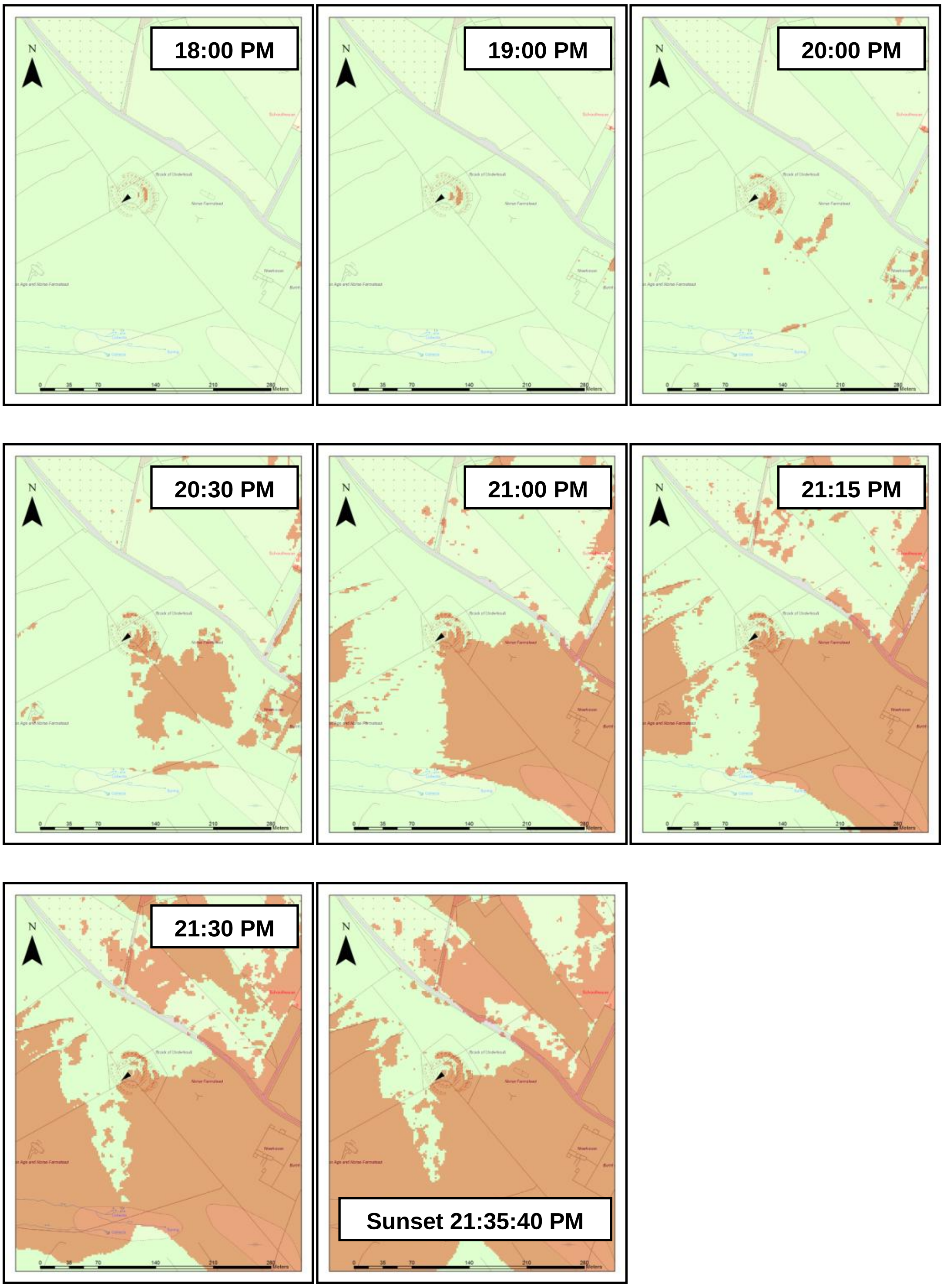


Figure 5.199. 18:00 PM to Sunset (21:35:40 PM) around Underhoull on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 19: West Burra Firth

Canmore ID: 371

Entrance: WSW

The Broch and its Landscape Context

This broch, with its entrance in the WSW, stands on a low rocky islet (the Holm of Hebrista) in the Firth (Figures 5.200, 5.201, and 5.202). According to Spence, the broch was 'connected with the land by a bridge of large stepping-stones over which the sea flows at full tide' (Spence 1899), though the site is now inaccessible without a boat except at very low tide. The broch seems to command the Firth in which it is situated (Figure 5.203), having views of almost all of its shoreline, and with excellent views of its entrance, again suggestive of maritime influences here. Like other brochs, it has no line-of-site towards other brochs, but has fairly good views of the topography immediately surrounding the site.

The Winter Solstice (21st December) – Figures 5.204 and 5.205

The location of this site is interesting in that it receives very little light during midwinter. The site remains in the shade for much of the morning, not receiving direct light until some time between 10:00 AM and 11:00 AM. It retains light for a short space of time, losing it between noon and 13:00 PM, probably around 12:30 PM. In this way, the site loses over an hour's direct sunlight in the morning, and nearly two and a half hours of sunlight in the afternoon. Unlike Burga Water (1) broch which also loses morning and afternoon sun, and which is also situated on an islet, West Burra Firth broch does not face south to capture the midday sun. In order to capture the late morning and noon light during the winter, an orientation towards due S or SSE would have been better because the entrance towards the WSW would have gained no light whatsoever during this period.

The Equinox (21st March) – Figures 5.206 and 5.207

During spring and autumn, the broch would have gained light within about an hour of daybreak, and unlike winter, would have retained it for most of the day. Indeed, from around about 15:00 PM onwards, the WSW entrance would have retained direct sunlight until it fell into the shade around 18:10 PM, about twenty minutes before sunset. For this time of year then, the WSW entrance was ideal, retaining more light than an entrance towards the east would have.

The Summer Solstice (21st June) Figures 5.208, 5.209 and 5.210

During midsummer, it takes over an hour for the sun to peak over the north-eastern hills to light up the area around the broch. The site retains sun for the remainder of the day, until around 20:30 PM when it falls into shadow, about an hour before sunset. Nevertheless, the eastern entrance would have retained light for much of the afternoon, and would have been slightly better than an eastern entrance.

Conclusion

Unlike Burga Water (1) broch, this site's orientation was suited only for the spring, autumn and summer. The site seems to have sacrificed what must have been precious little direct sunlight during the winter months for an orientation that was suited especially for the spring and autumn. An eastern entrance would have lost more light between March and September; however, an entrance towards the SSE would have been better during midwinter, and the interior of the broch must have been fairly dark during this period of the year. Like Burga Broch (1), this also raises questions as to why this location was selected over potentially better lit areas on the mainland, and hints at the possibility of seasonal use.

Figure 5.200. West Burra Firth Broch.
Author's Photo, from the north-east.

Figure 5.201. West Burra Firth Broch, looking eastwards.
Author's Photo.

Figure 5.202. Ground Plan of West Burra Firth.
(After: RCAHMS 1946: 100).

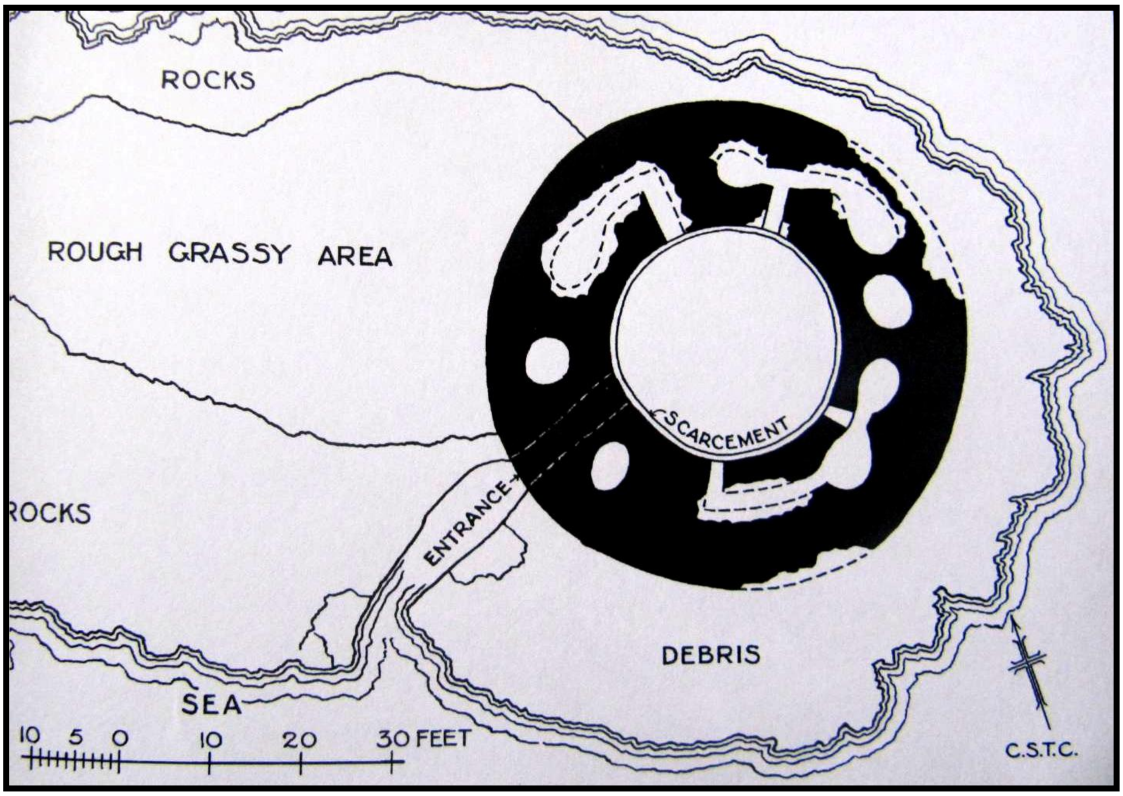


Figure 5.203. Multiple Viewsheds of West Burra Firth Broch.

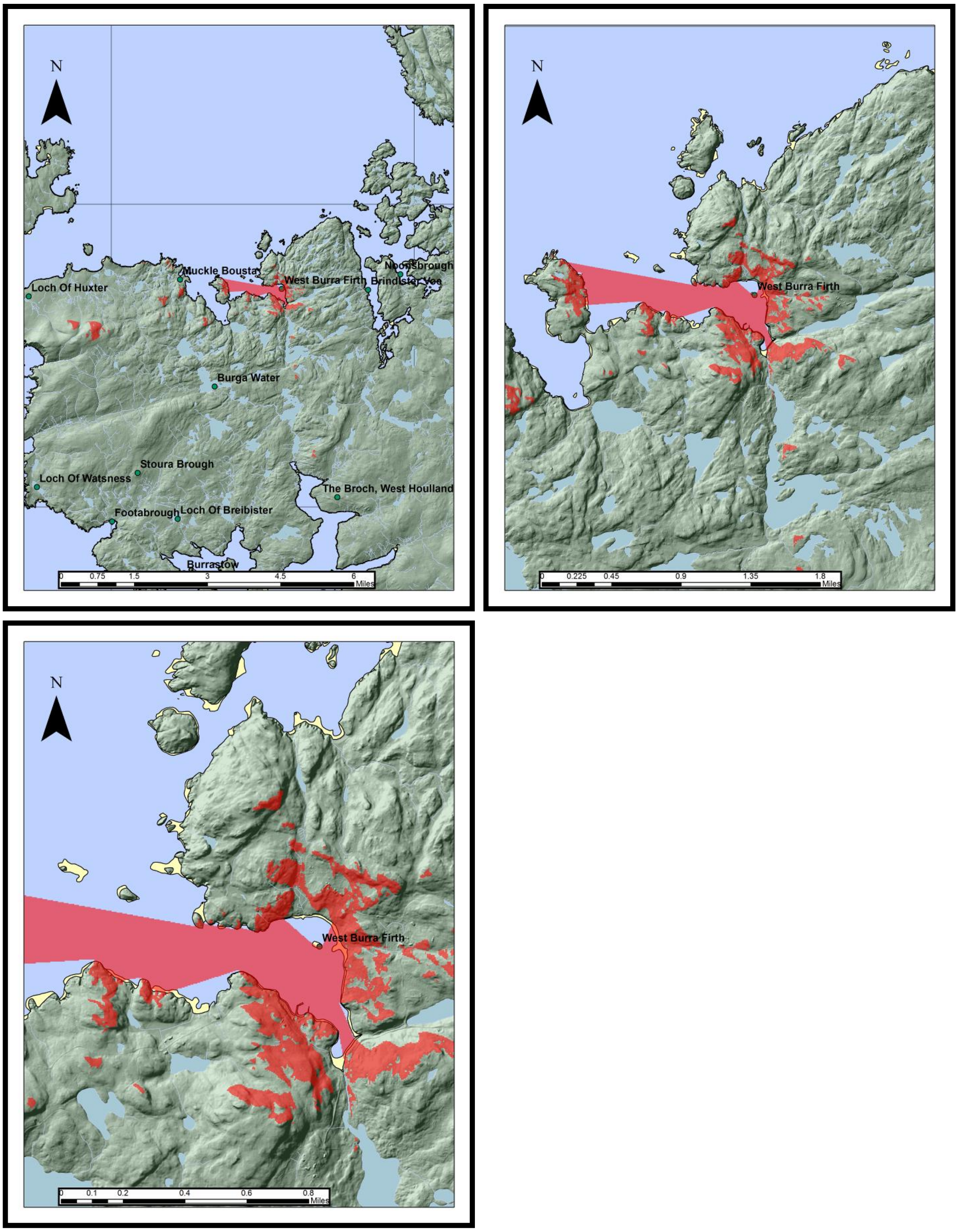


Figure 5.204. Sunrise (09:12:40 AM) to 14:00 PM around West Burra Firth on the Winter Solstice (21st December). Red areas denote areas of

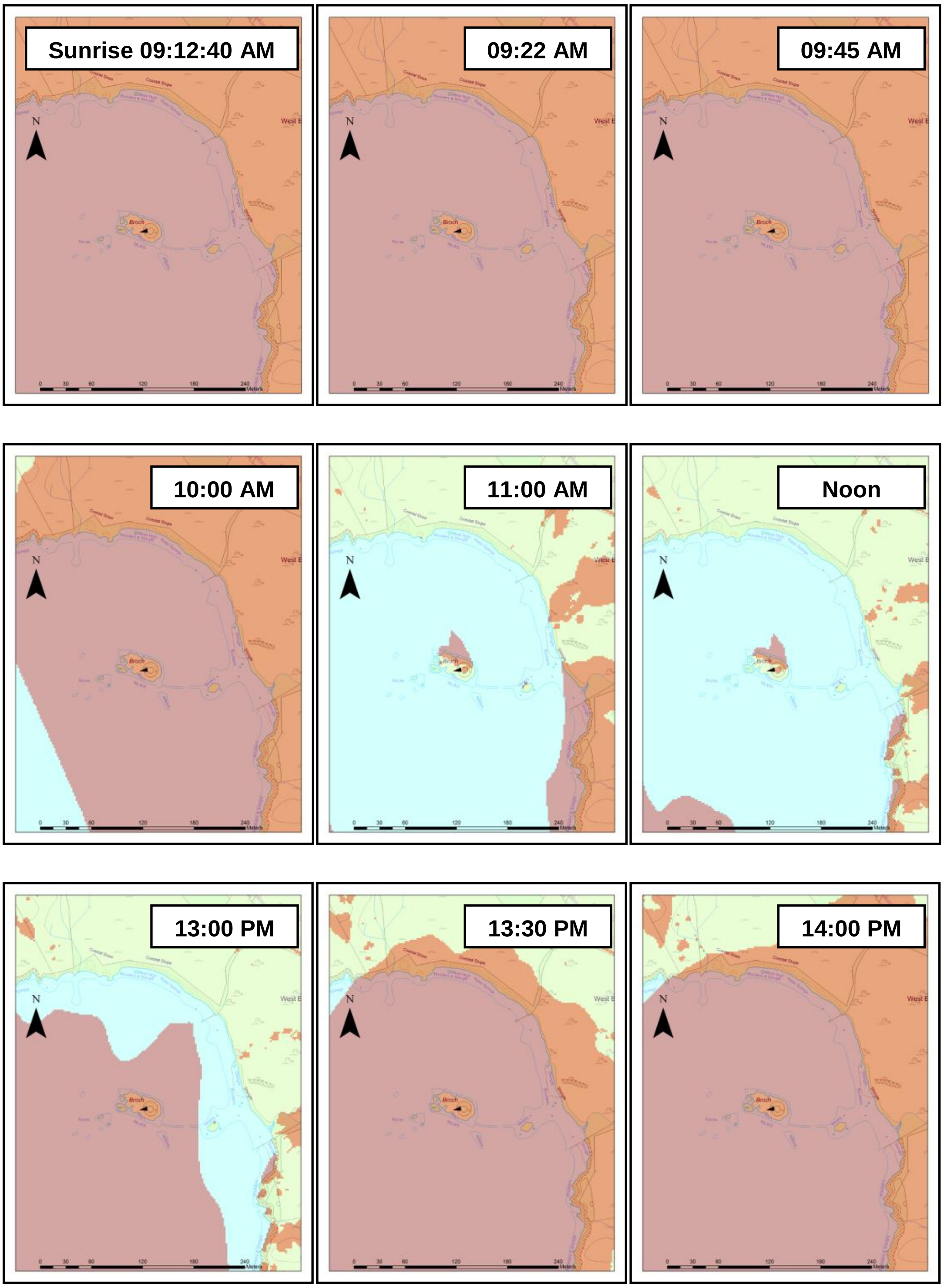


Figure 5.205. 14:15 PM to Sunset (14:53:10 PM) around West Burra Firth on the Winter Solstice (21st December). Red areas denote areas of

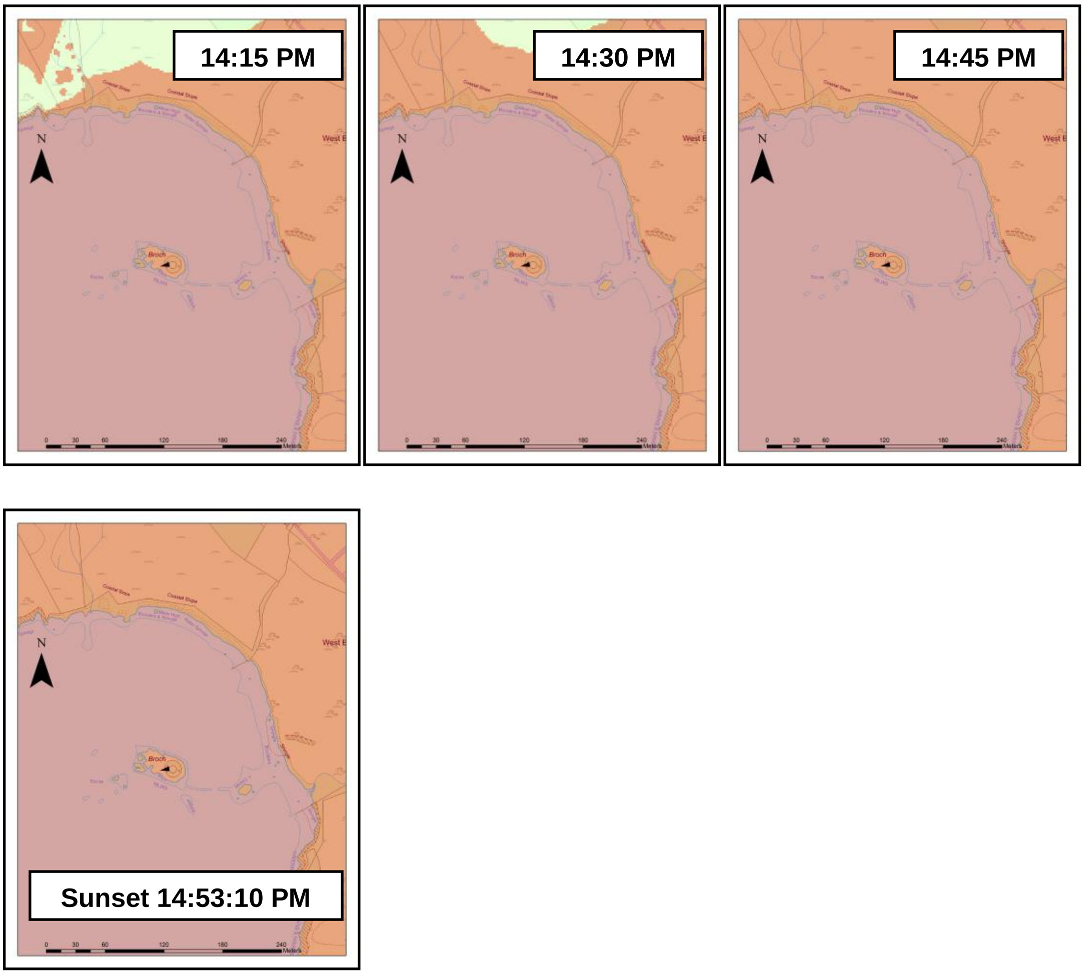


Figure 5.206. Sunrise (06:05:05 AM) to Noon around West Burra Firth on the Spring Equinox (21st March). Red areas denote areas of shadow.

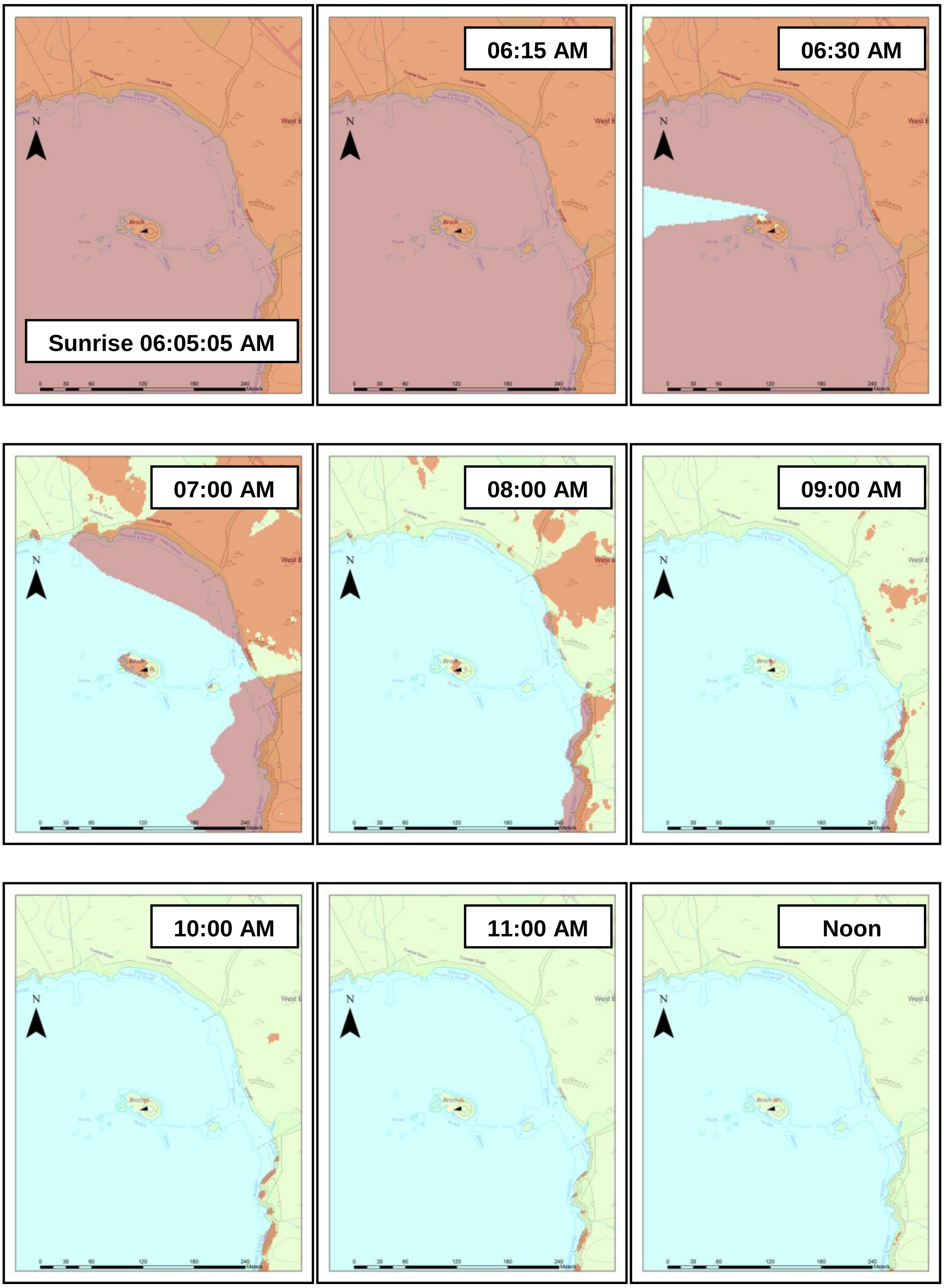


Figure 5.207. 13:00 PM to Sunset (18:19:55 PM) around West Burra Firth on the Spring Equinox (21st March). Red areas denote areas of shadow.

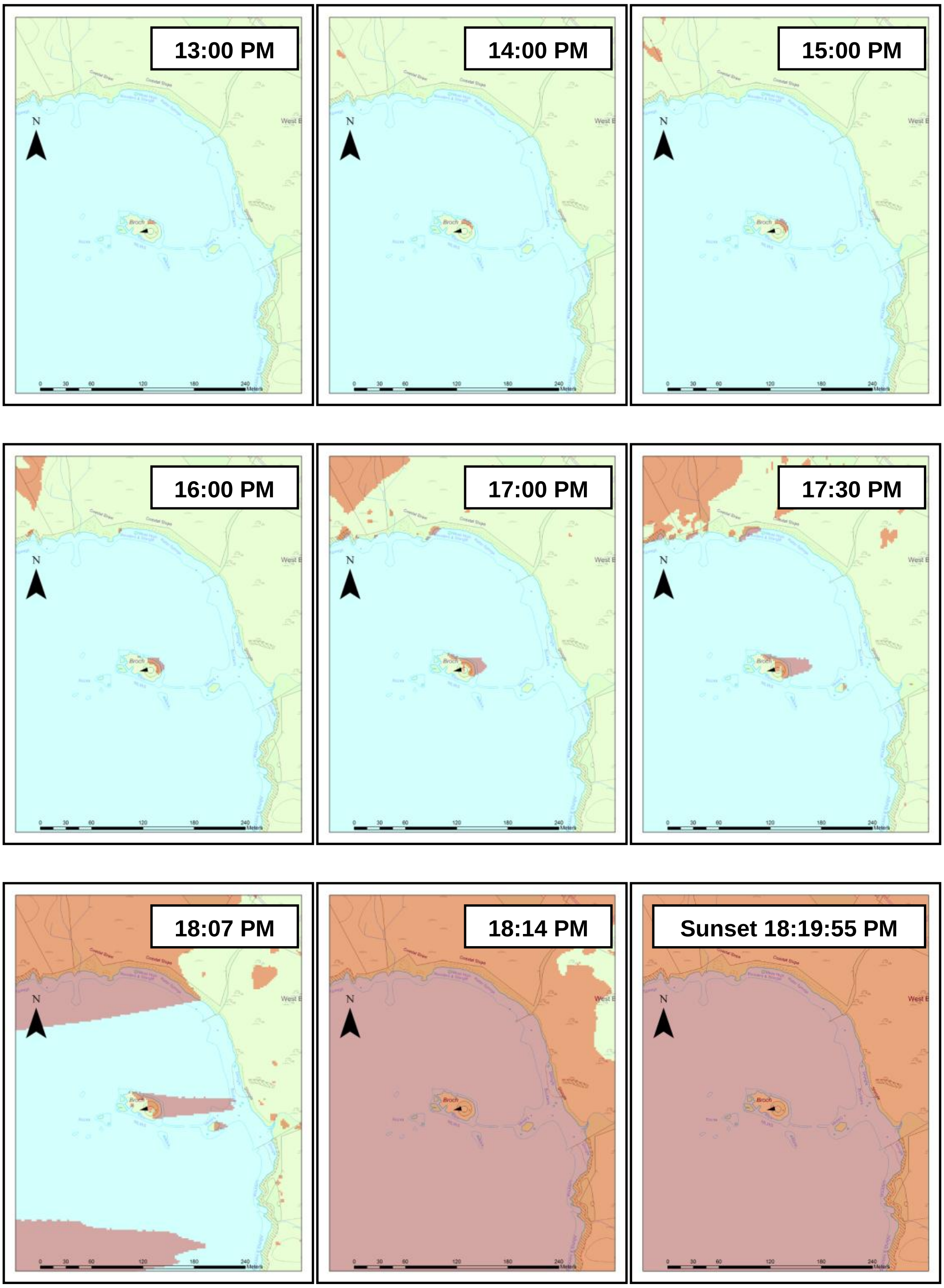


Figure 5.208. Sunrise (02:41:20 AM) to 09:00 AM around West Burra Firth on the Summer Solstice (21st June). Red areas denote areas of shadow.

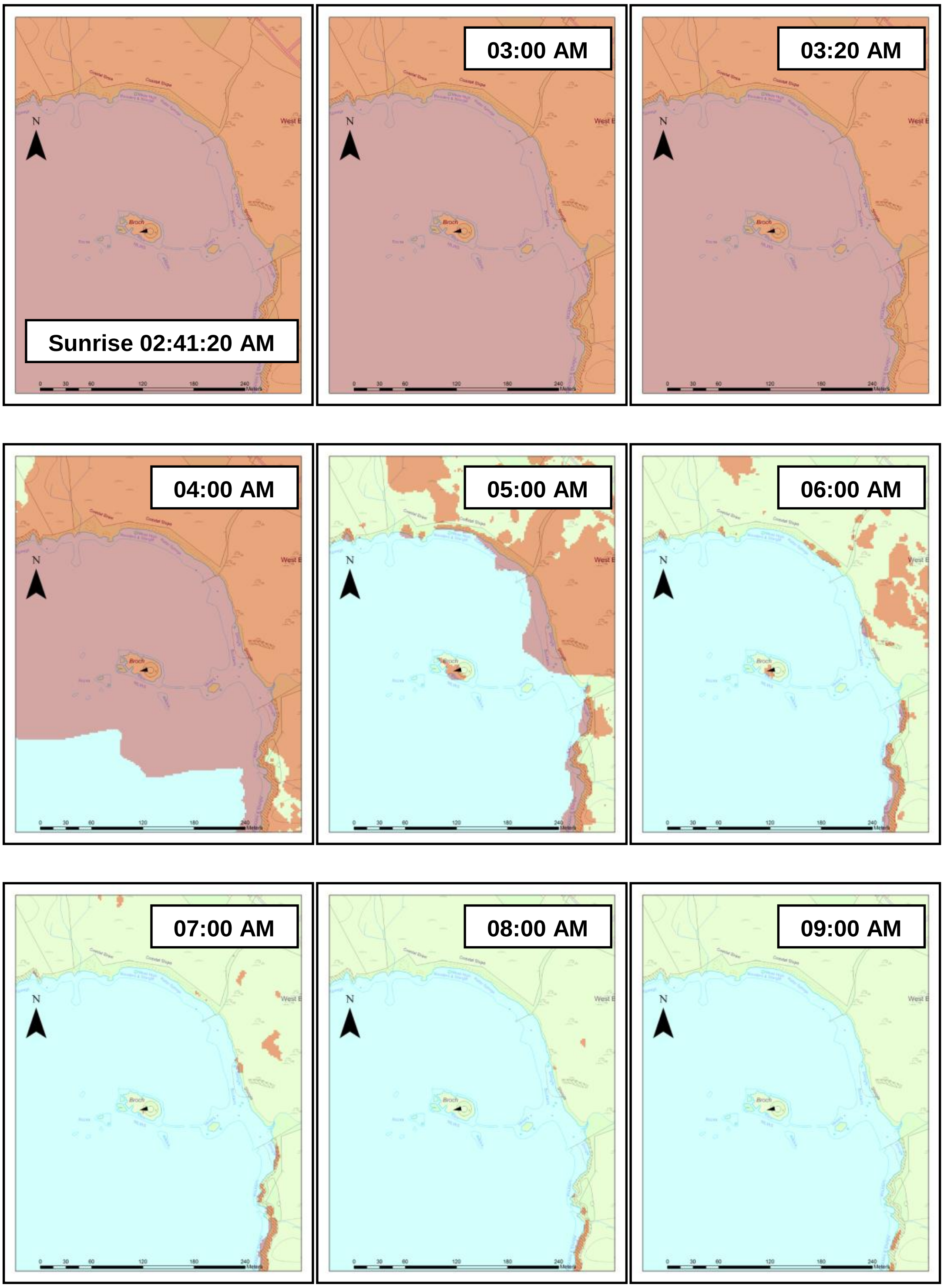


Figure 5.209. 10:00 AM to 18:00 PM around West Burra Firth on the Summer Solstice (21st June). Red areas denote areas of shadow.

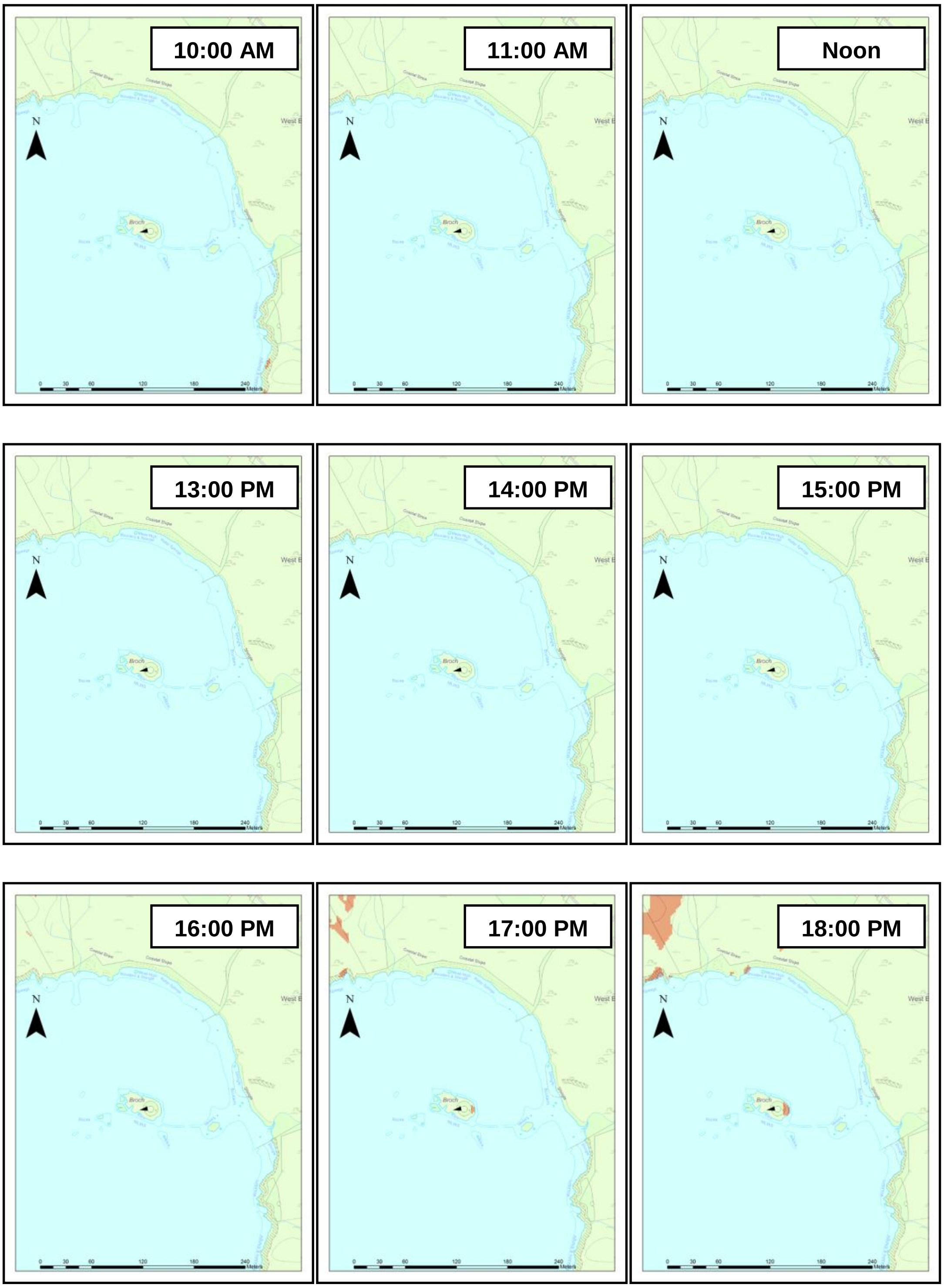
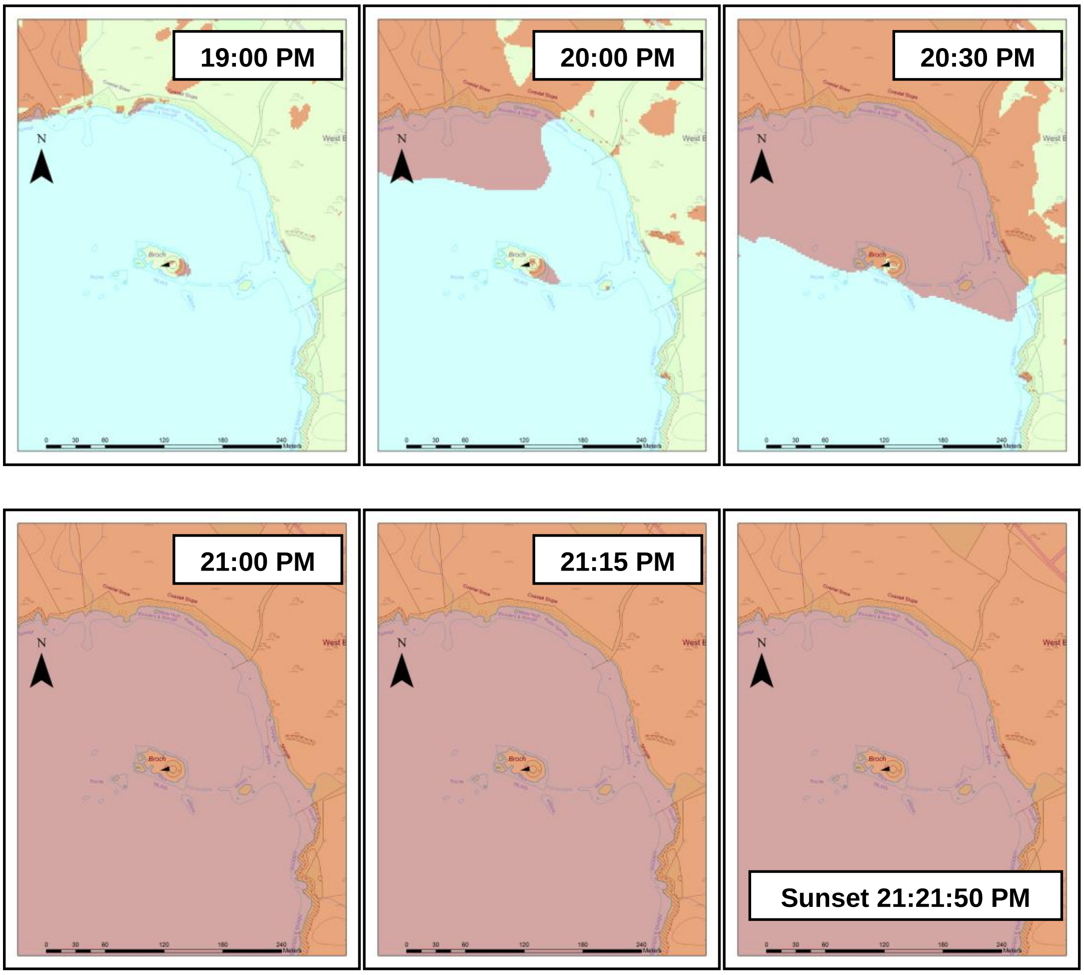


Figure 5.210. 19:00 PM to Sunset (21:21:50 PM) around West Burra Firth on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 20: Loch of Houlland

Canmore ID: 498

Entrance: WSW

The Broch and its Landscape Context

This unexcavated broch (Figures 5.211, 5.212 and 5.213), with its entrance in the WSW (MacKie 2002a: 61; RCAHMS 1946: 89), occupies much of a small, low promontory which extends out into the Loch of Houlland. As seen from Figure 5.214, this broch is rare as it does not have a clear view of the sea, though its views do extend to the cliffs in the west. Furthermore, it has no clear view of any other broch, though it does have a partial view of Sae Breck to the SSW. However, as it is situated in a lake, it has good views of this water body and of the hills which surround it, though these do limit the view of the rest of the mainland.

The Winter Solstice (21st December) – Figures 5.215 and 5.216

In the winter, the site's south-eastern side gains sunlight about half an hour after sunrise. The site and its small island retain sunlight for much of the day, until at least 14:15 PM, about forty minutes before sunset. For the winter then, the site does benefit from good direct sunlight compared to many other island (promontory) sites in Shetland. However, an entrance towards the SE would probably have been marginally better with regards to light. As the only access to the island is from the NW, it may have been considered that a western entrance would make it easier to enter the site, though it nevertheless still faces the prevailing winds.

The Equinox (21st March) – Figures 5.217 and 5.218

About half an hour after sunrise, the site gains light, and by 08:00 AM the island and the broch is in full light, retaining it for much of the day. The entrance, which is WSW, is suited to this time of year (as well as winter), however, between 17:30 and 18:00 PM, the site falls into shadow, probably around forty minutes before sunset. Again then, an eastern entrance would have been marginally better than the WSW.

The Summer Solstice (21st June) Figures 5.219, 5.220 and 5.221

The broch gains light between 03:00 AM and 03:20 AM, about half an hour after sunrise, again. The entire landscape surrounding the broch gains light by 04:00 AM, retaining it for the day. The slightly elevated position of the broch in the loch allows the site to retain light during the midsummer period until around 21:15 PM, about twenty-five minutes before sunset. In the summer then, the broch's western side gains marginally more light. However, the WSW entrance is suited to the winter and early spring period, and so the benefits may have been marginal.

Conclusion

For this site, the eastern half of the broch would have only gained mere minutes more light than the western half throughout much of the year. Though the entrance faces into the prevailing winds, which are fierce in Shetland, this suggests that the WSW entrance was selected because it would have been easier to access. It may also hint at an importance of retaining afternoon light.

Figure 5.211. Loch of Houlland Broch.
Author’s Photo, from the north-west.

Figure 5.212. Looking towards the WSW down the line of the original entrance of Loch of Houlland. Author’s Photo.

Figure 5.213. Looking towards the SE from Loch of Houlland. Author’s Photo.

Figure 5.214. Multiple Viewsheds of Loch of Houlland Broch.

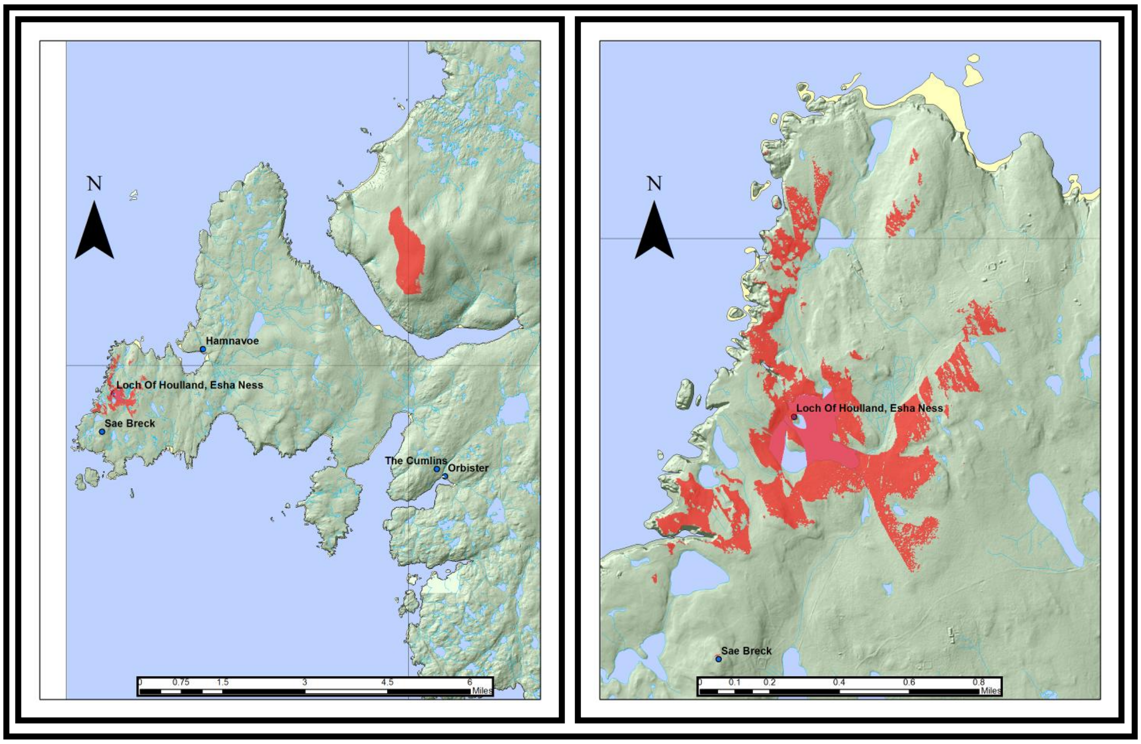


Figure 5.215. Sunrise (09:16 AM) to 14:00 PM around Loch of Houlland on the Winter Solstice (21st December). Red areas denote areas of shadow.

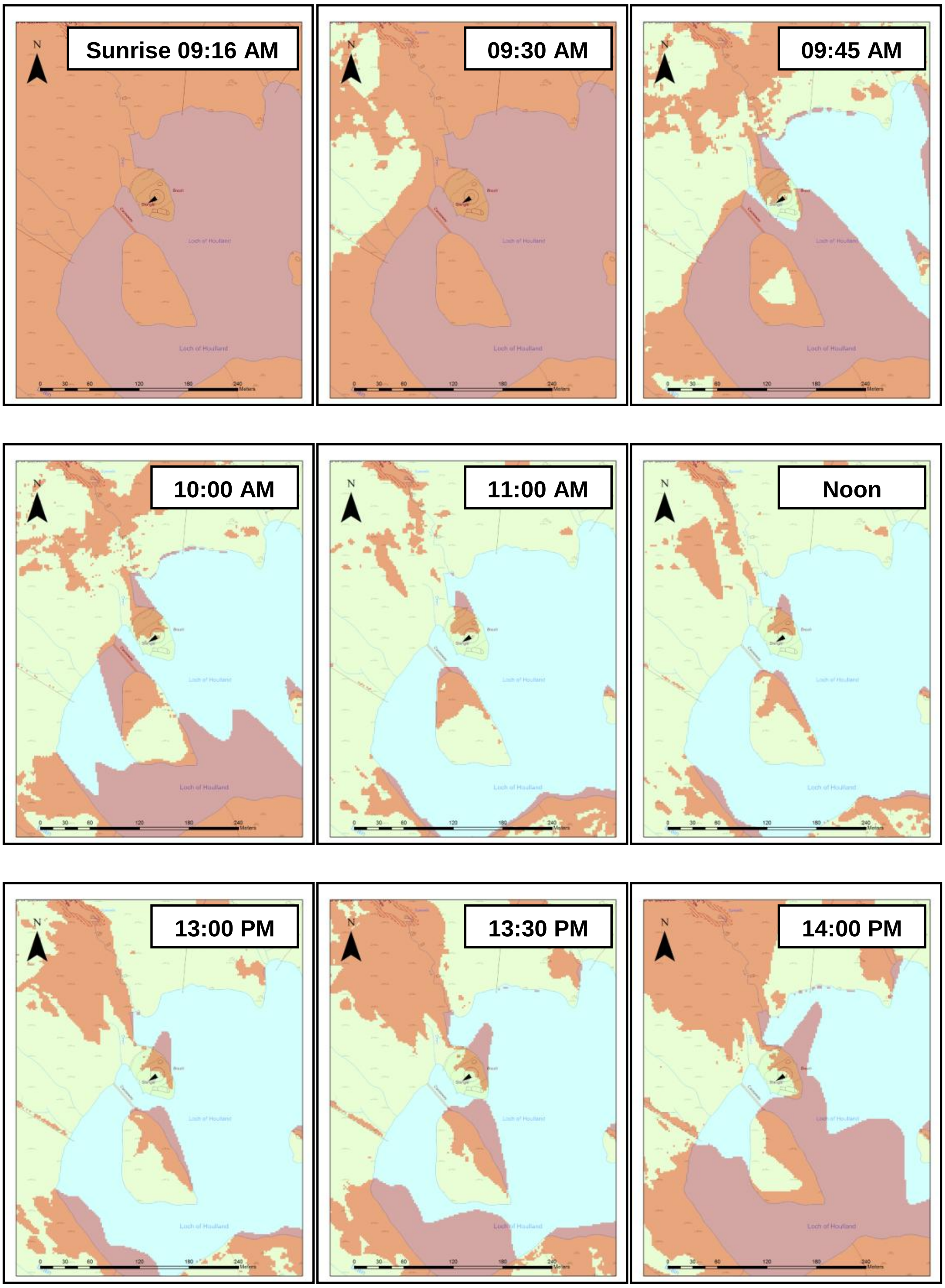


Figure 5.216. 14:15 PM to Sunset (14:49:50 PM) around Loch of Houlland on the Winter Solstice (21st December). Red areas denote areas of shadow.

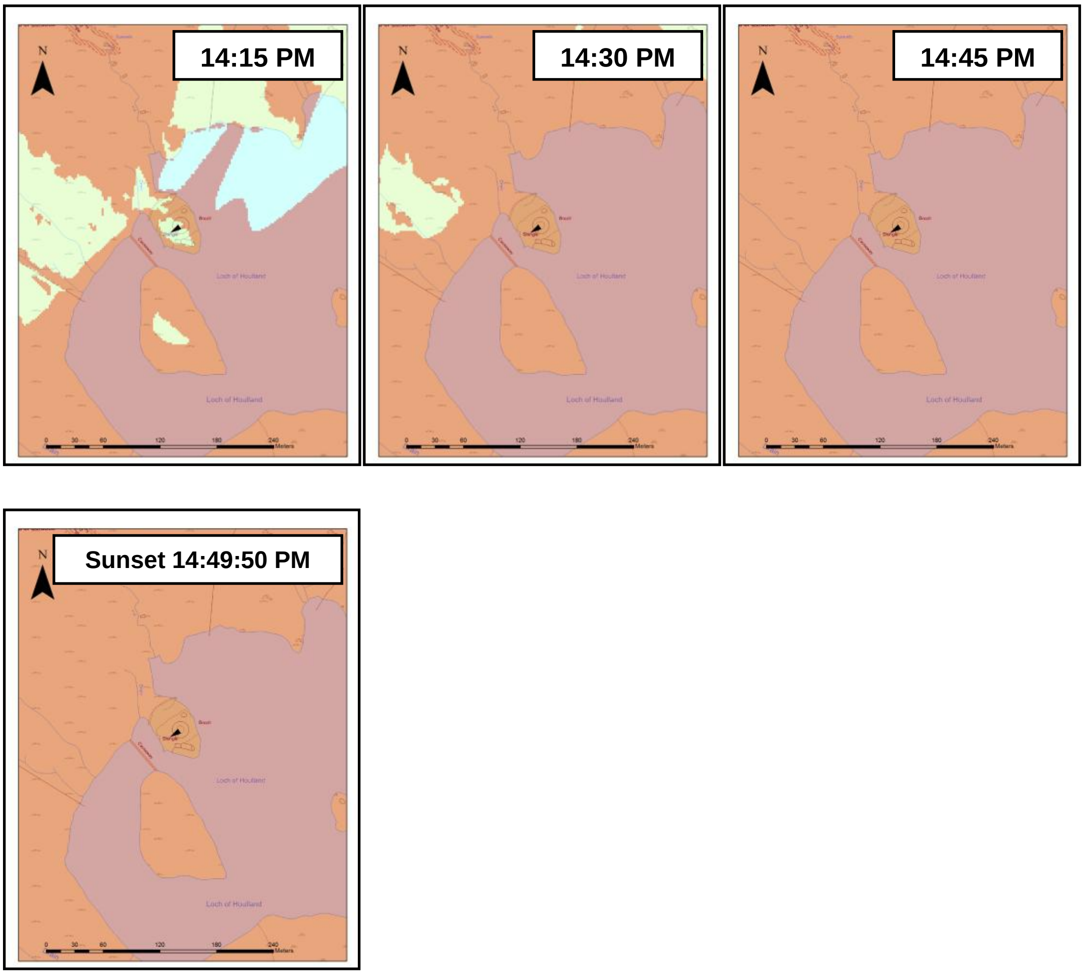


Figure 5.217. Sunrise (06:04:45 AM) to Noon around Loch of Houlland on the Spring Equinox (21st March). Red areas denote areas of shadow.

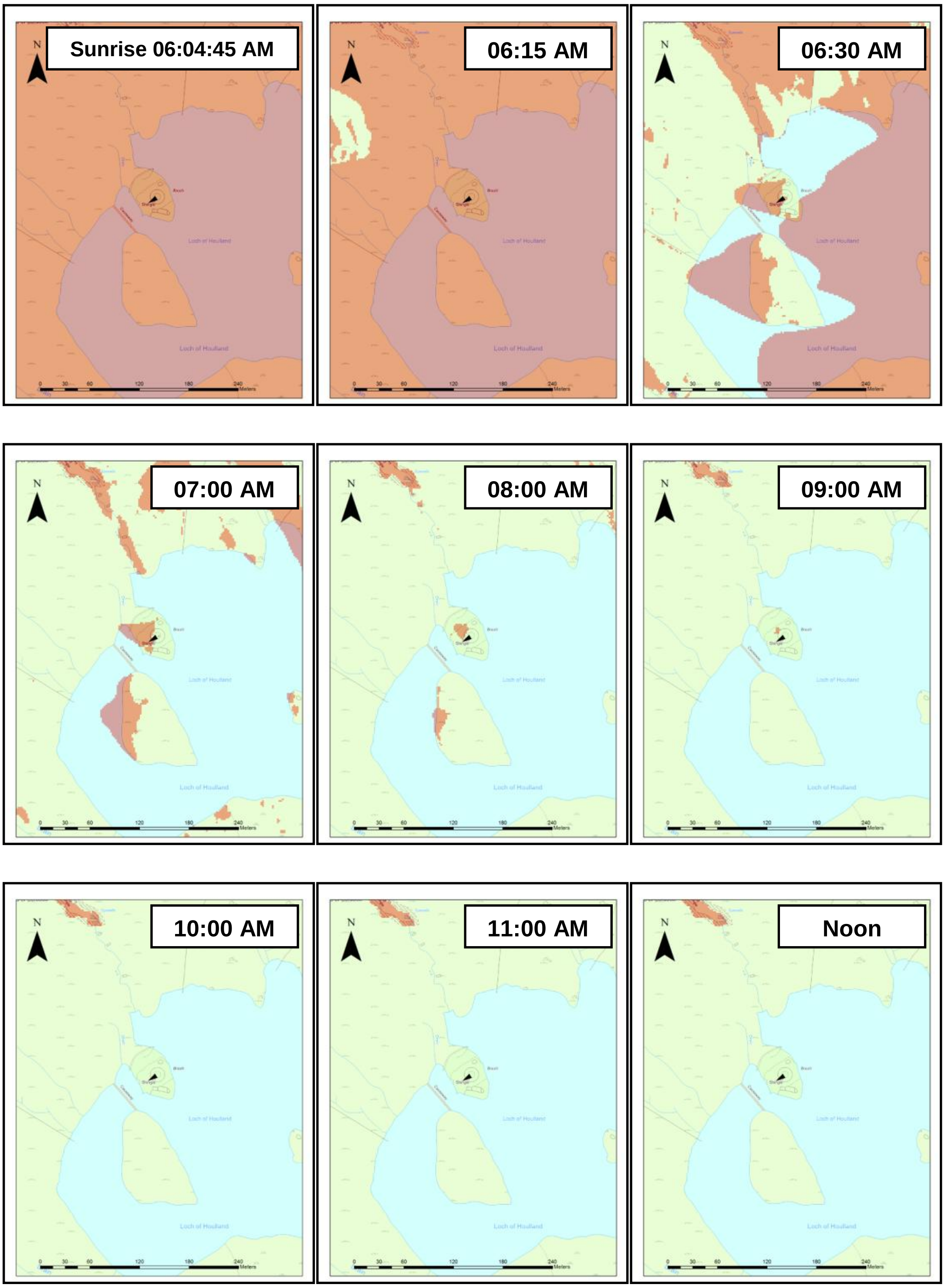


Figure 5.218. 13:00 PM to Sunset (18:19:45 PM) around Loch of Houlland on the Spring Equinox (21st March). Red areas denote areas of shadow.

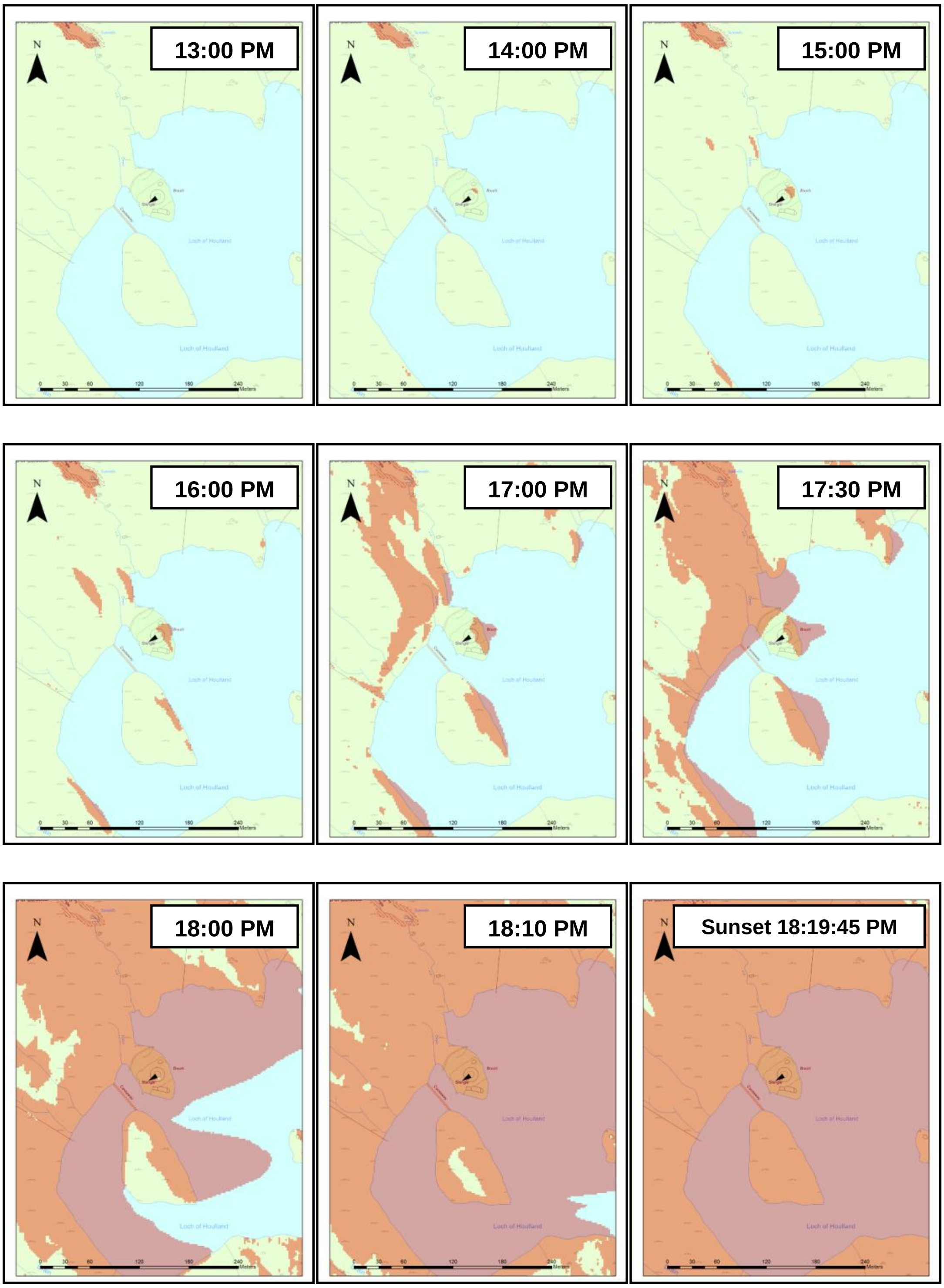


Figure 5.219. Sunrise (02:36:50 AM) to 08:00 AM around Loch of Houlland on the Summer Solstice (21st June). Red areas denote areas of shadow.

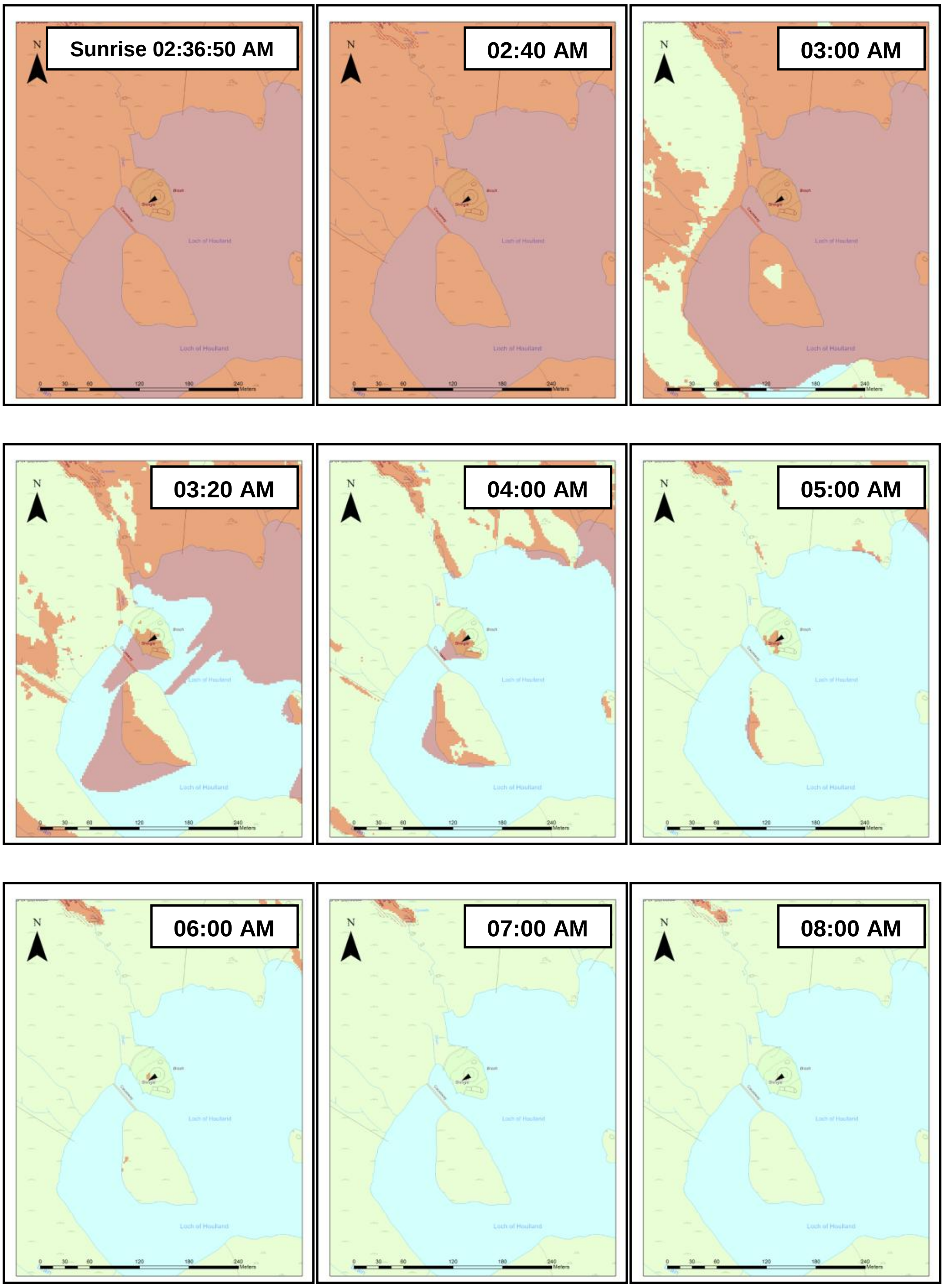


Figure 5.220. 09:00 AM to 17:00 PM around Loch of Houlland on the Summer Solstice (21st June). Red areas denote areas of shadow.

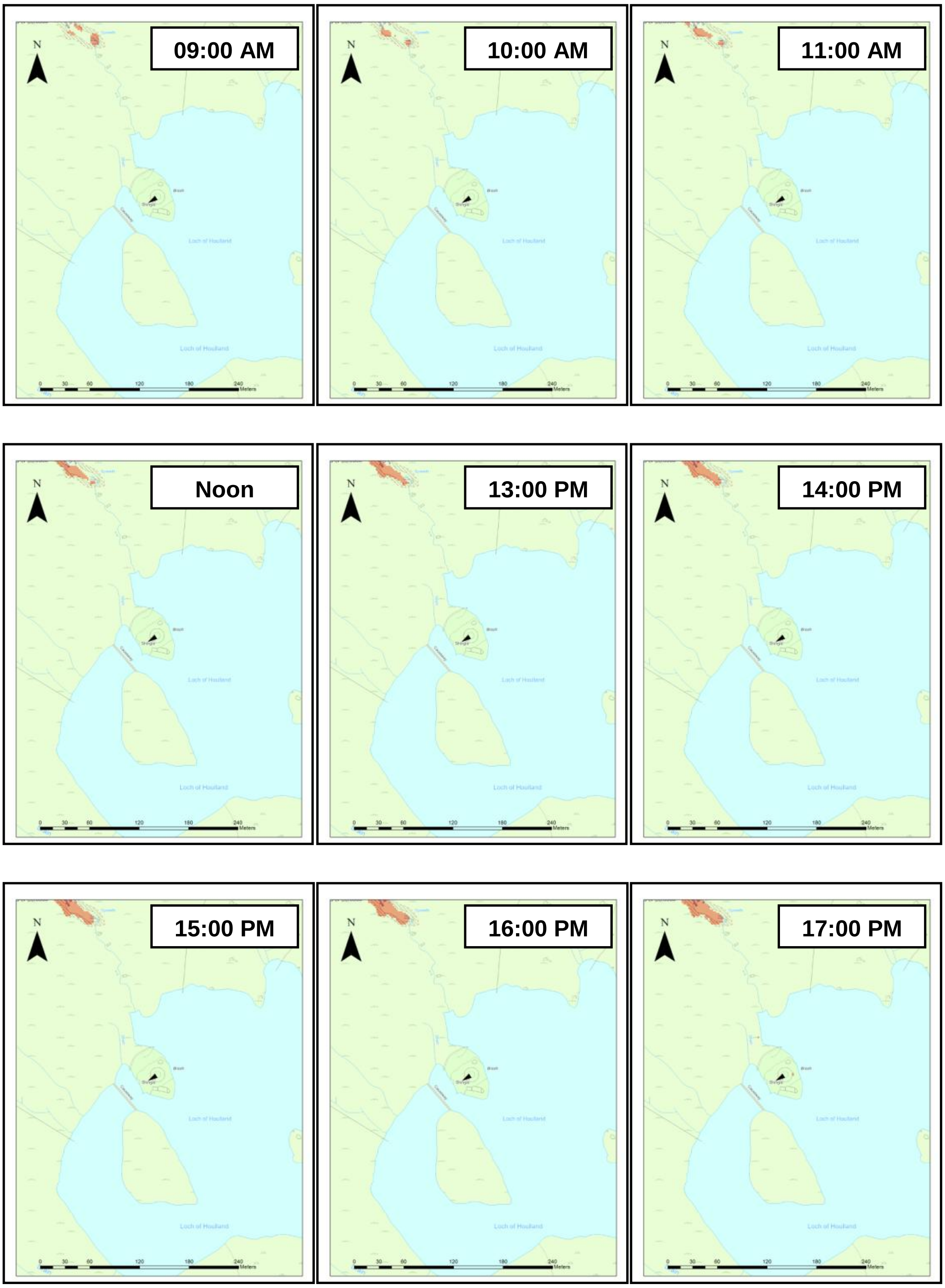
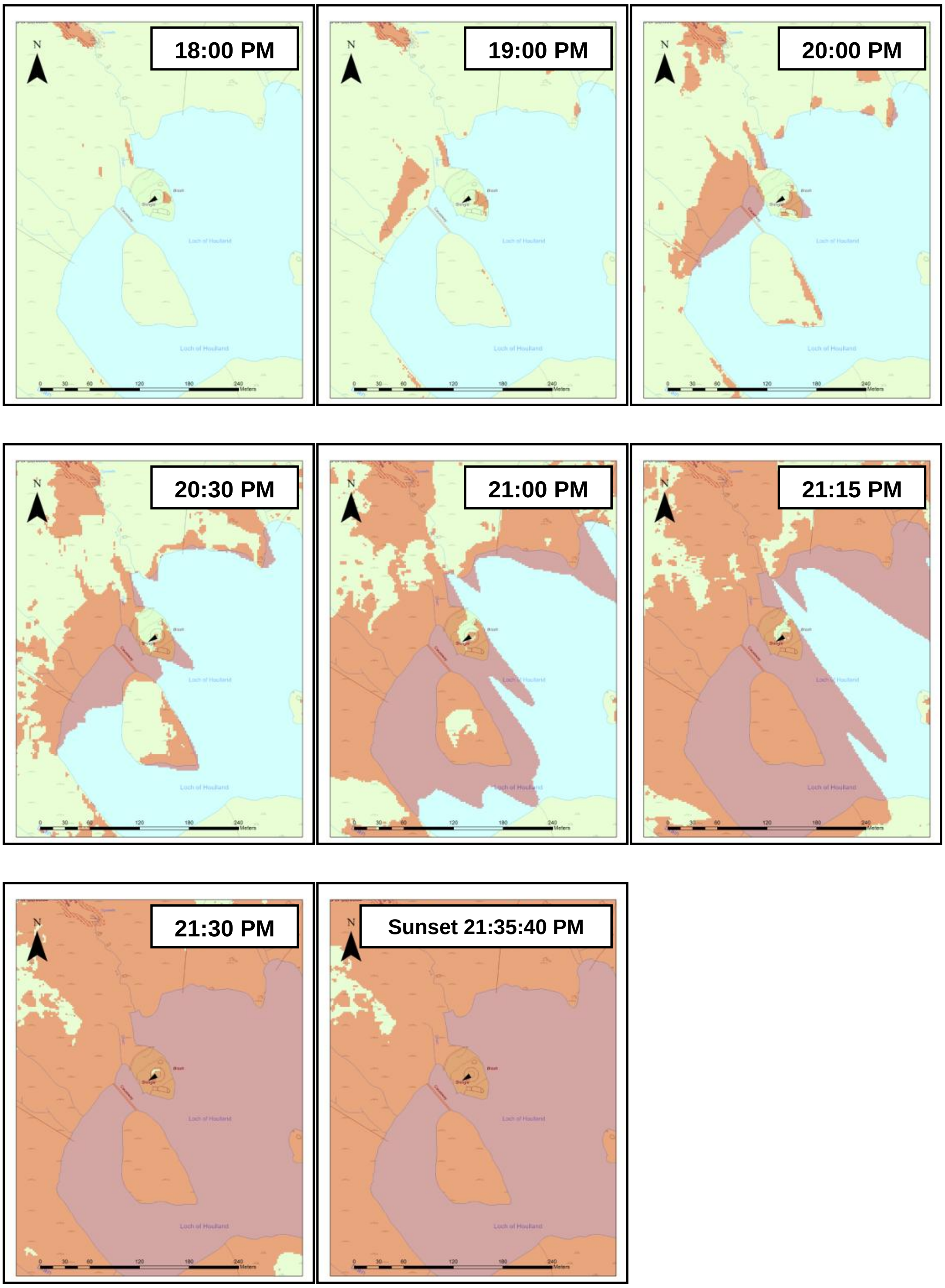


Figure 5.221. 18:00 PM to Sunset (21:35:40 PM) around Loch of Houlland on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 21: Mousa Broch

Canmore ID: 944

Entrance: W

Widely regarded as the most well-preserved broch in Scotland (Figures 5.222 and 5.223) – and thereby warranting a more detailed discussion here – Mousa stands on the flat rock surface of a low promontory near the western shore of Mousa Island, and has been surveyed and researched in depth over the years (Armit 1998: 97-99; 2003: 57-61, 138-139; Cruden 1951; Cunliffe 2001: 354; Dryden 1862; 1890; Fojut 1982a; Hamilton 1983; Paterson 1922; Paxton and Shipway 2007: 249-250; Ritchie 1985: 127-129; Stuart 1862). Its grey stone tower stands 13.27m (43ft 6ins) high at present, and may have originally reached 15.25m (50 ft.). The doorway into the broch faces west, and has a lengthy entrance passage at 16 ft. long, and is reminiscent of the length of many Neolithic passage tombs.

Mousa is known to be an exceptionally well-built broch, and Fojut (1982a) has previously reviewed the proportions and architecture of Mousa, noting that its wall-base percentage (64.5%) is so much greater than those of other brochs in Shetland that it significantly alters the mean wall-base percentage of that island group. On the reasonable assumption that the greater the relative massiveness of the wall base of a broch, the greater its original height, Mousa probably stood apart from other brochs in the Iron Age, perhaps with the exception of Nybster, in Caithness. Indeed, if it was not the tallest, then it was at least one of the tallest and can certainly be regarded as one of the most stable and well constructed brochs. With this in mind, we could assume that the great care taken in building this structure was also taken when deciding its location and the orientation of its doorway.

The Broch and its Landscape Context

As seen in Figure 5.224, the broch has a commanding position overlooking Mousa Sound. Indeed, it dominates this seaway and so any boat sailing down the sound would surely have been aware of the tower, which was built, perhaps, to control movement along this seaway. This is a possibility because, for Mousa, the range of the westward (seaward) view from the tower is far greater than that of the eastern (landward) side, suggesting that boat-going observers were the object of the builder's attention. Afterall, considering its commanding position, Mousa does not have excellent and far-ranging views of Mainland Shetland, which lies on higher ground to the west of Mousa Island. We should also consider that of the brochs in the local area, only Burraland – about a mile away, across the sound – can be seen from the Mousa, suggesting it was not the attention of other brochs that was primarily desired, but the attention of those who were on the seaways. As noted above, this is a case very true for many of Shetland's brochs (e.g. Hawk's Ness; Burraland).

The Winter Solstice (21st December) – Figures 5.225 and 5.226

The broch and much of its surrounding landscape is in shadow as the sun rises between 09:10 AM and 10:00 AM. In fact, it is not until 11:00 AM that the area around Mousa gains direct sunlight, especially on its southern side. This means that as the sun progresses from the east to the south, much of the eastern side of the broch is left in the shade. It is not until noon that the sun can rise to such an extent that it peaks over the cliffs that lie to the south of the broch, and this allows the southern area around the broch to gain direct sunlight. For the remainder of the day – which lasts only a few more hours – the sun travels westward, over Mousa Sound, finally being unobstructed by the cliffs of Mousa Island. This means that the southern and western sides of the broch gain direct sunlight, and even forty-five minutes before sunset, at 14:00 PM, the lowland bay around Mousa is still in sunlight, even though much of the surrounding landscape now lies in shade.

This suggests that the broch's location was carefully considered. It is, afterall, not only located on a bay with a commanding view of Mousa Sound, as noted, but it is also located within one of the best pockets of light availability during the darkest month of the year. Throughout the afternoon at least, the bay is in direct sunlight, while much of the area around it lies in the shade.

Finally, as the sun sets around 14:45 PM, we can see that the WSW side of the tower remains in light. This demonstrates that, with regards to the winter solstice at least, Mousa's western entrance would have allowed much more daylight into the broch than an eastern or south-eastern entrance. Though a southern entrance would equally have allowed direct light in, a southern doorway would have fallen into the shade around 14:00 PM – forty-five minutes before sunset. With regards to the winter solstice, an entrance towards the SW would have probably supplied more light than the western entrance does. However, it should be remembered that for the rest of the year, the SW would have proved too southerly for direct sunlight, suggesting a carefully selected entrance for all year light provision.

The Equinox (21st March) – Figures 5.227 and 5.228

During the equinox, as the sun rises just after 06:00 AM, the tower of Mousa is high enough so that anyone standing at the wall head would have been able to see the sun rise over the horizon, even though the surrounding landscape is in shadow. By 06:15 AM, the eastern side of the tower would have been in light, and by 07:00 AM, the area to the east of the tower is out of shadow. By 08:00 AM, most of the surrounding landscape is in direct sunlight. For the rest of the day, this remains the case, until around 18:00 PM when the sun falls behind the hills on Mainland Shetland, and the shadow of these hills is cast upon Mousa Sound. Five minutes later at 18:05 PM, the shadow encroaches around the broch, until at 18:10 PM (19 minutes before sunset), almost all the landscape is in shadow. Nevertheless, the low sun in the afternoon would have permitted direct sunlight to enter the broch unhindered from around 13:00 PM to 18:00 PM.

The Summer Solstice (21st June) – Figures 5.229, 5.230 and 5.231

Rising in the north-east at 02:44:10 AM, the sun first lights the southern cliffs on Mousa Island which represent the highest region of this island. But it is not until between 03:00 AM and 04:00 AM that the sun can reach the altitude required to illuminate the area around the broch. From 04:00 AM to 06:00 AM, most of the eastern section of the broch – especially the NE – is in direct sunlight, until by 07:00 AM, when the full eastern half gains sunlight. At the summer solstice, the sun is higher in the sky than at any other time of the year, and this means that by 09:00 AM, from the north to the SW, the broch has light coverage. Direct sunlight is retained on the western half until around 21:00 PM; a total of ten hours of direct light; about the same as the eastern half gets.

Conclusion

During the spring equinox, Mousa gains about six hours of direct sunlight on its eastern half, and slightly more than six on its western half. And for the summer solstice, the west retains around the same amount of light as the east. However, during midwinter, the southern cliffs are high enough to omit much of the eastern (morning) sunlight and so a western orientation is logical. However, Mousa's due west orientation means that the interior receives slightly less sunlight than a SW entrance would have, especially during winter. Yet, the western orientation does allow more sunlight to directly enter the broch from around the time of the spring equinox onwards. This is because the sun is lower in the W than it is in the SW during the summer months. Furthermore, and an issue not to go unnoticed, is the fact that due W doorways block out much of the south-westerly winds that are very strong down Mousa Sound. On this note, Mousa's western orientation is functionally logical for this location.

Figure 5.222. Ground Plan of Mousa.
(After RCAHMS 1946)

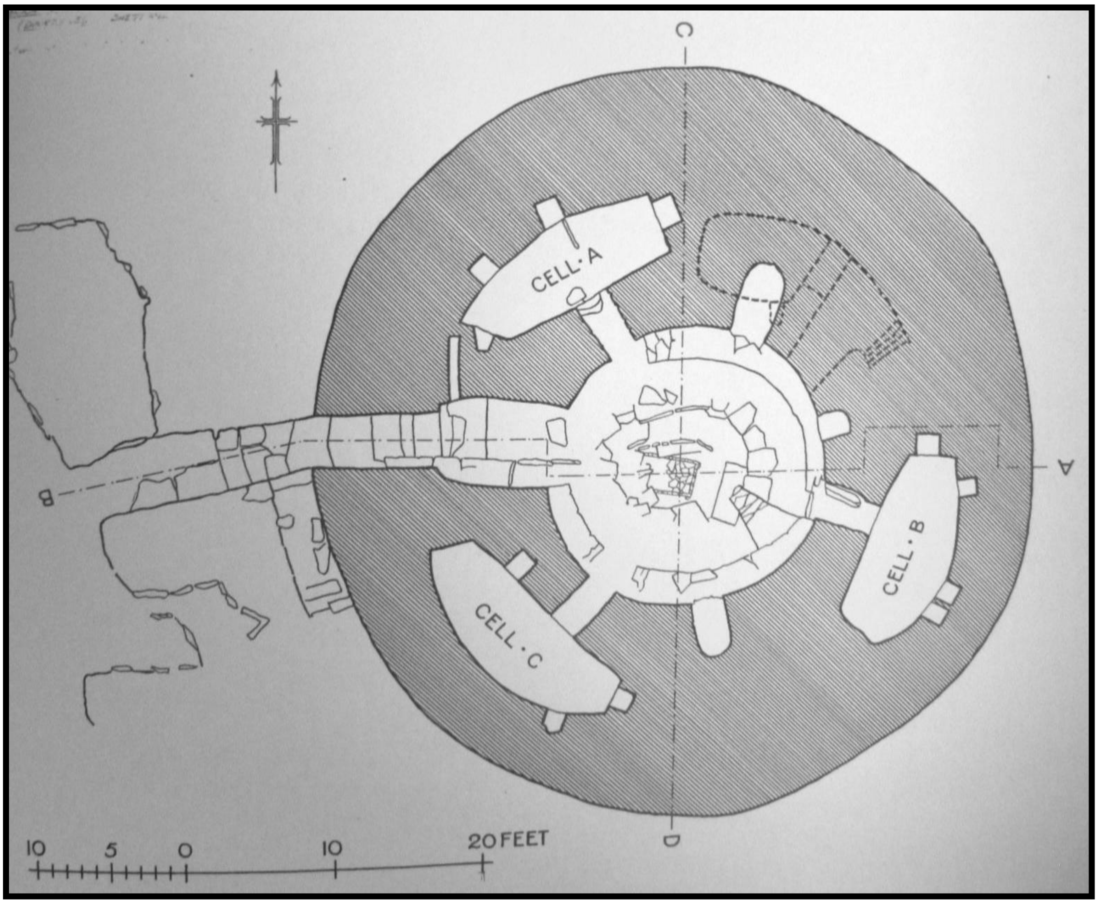


Figure 5.223. View towards Mousa Broch, looking towards the western entrance. Author’s Photo, from the west.

Figure 5.224. Multiple Viewsheds of Mousa Broch.

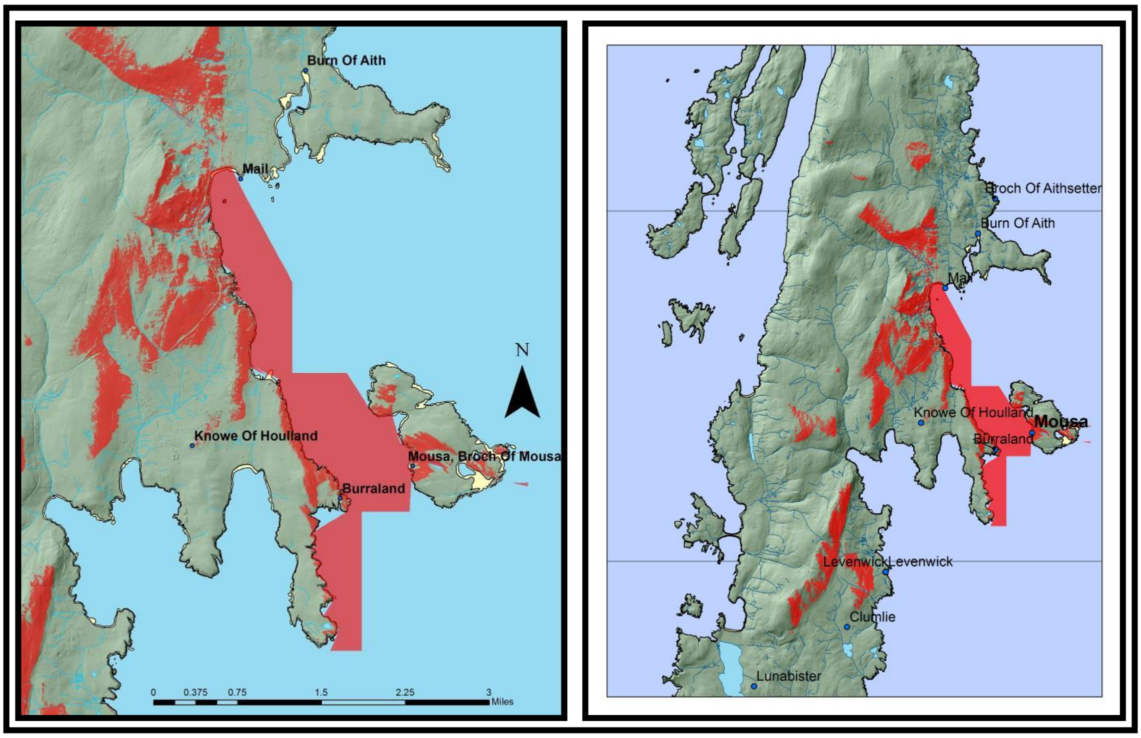


Figure 5.225. Sunrise (09:10 AM) to 14:40 PM around Mousa on the Winter Solstice (21st December). Red areas denote areas of shadow.

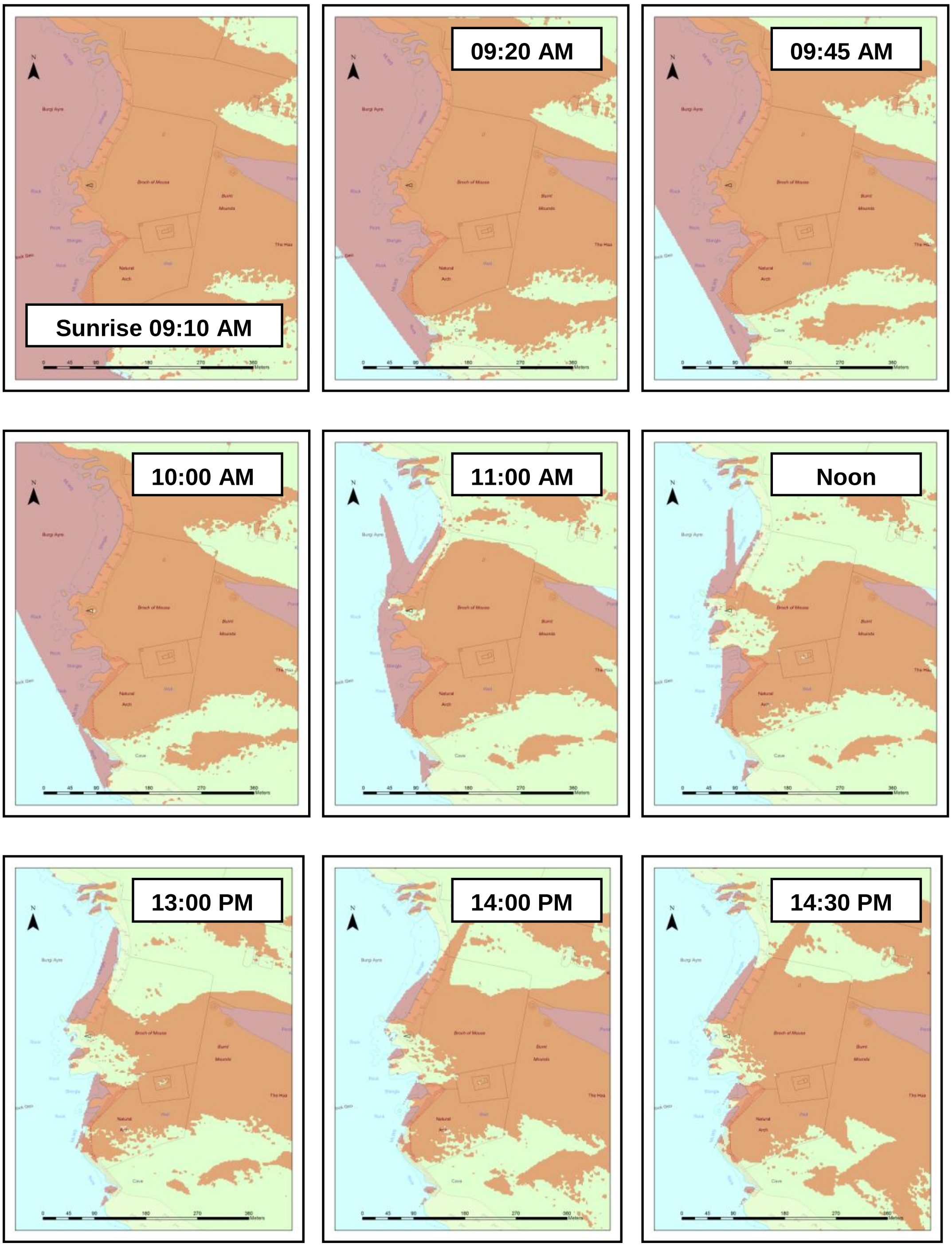


Figure 5.226. Sunset (14.45pm) around Mousa on the Winter Solstice (21st December). Red areas denote areas of shadow.

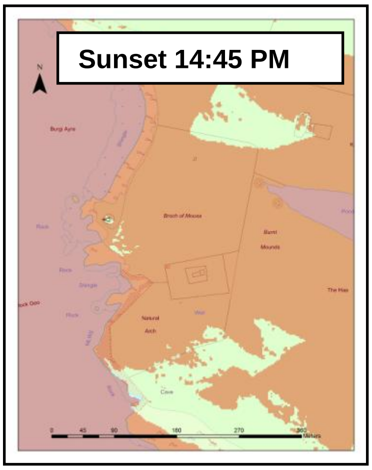


Figure 5.227. Sunrise (06:05:10 AM) to Noon around Mousa on the Spring Equinox (21st March). Red areas denote areas of shadow.

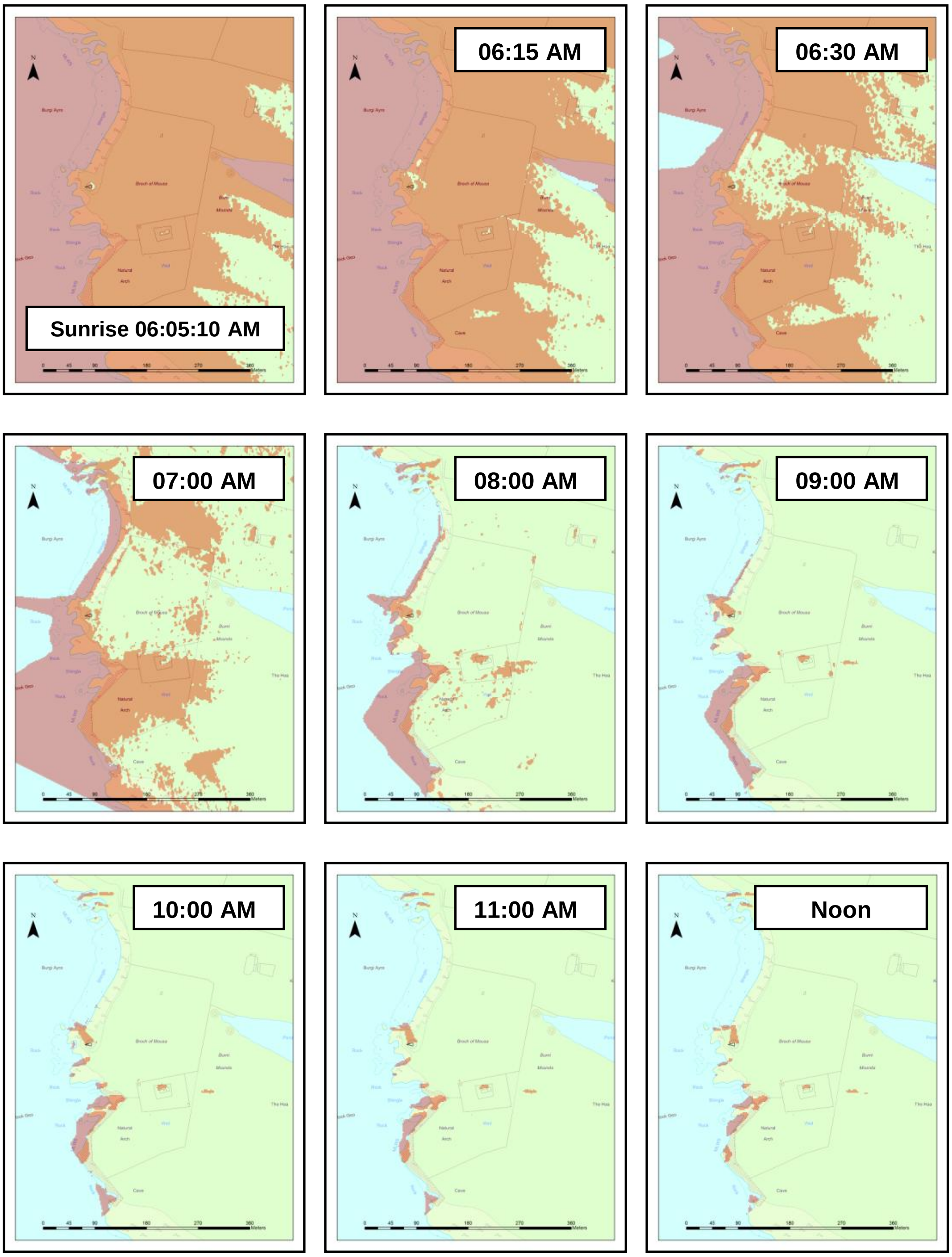


Figure 5.228. 13:00 PM to Sunset (18:19:50 PM) around Mousa on the Spring Equinox (21st March). Red areas denote areas of shadow.

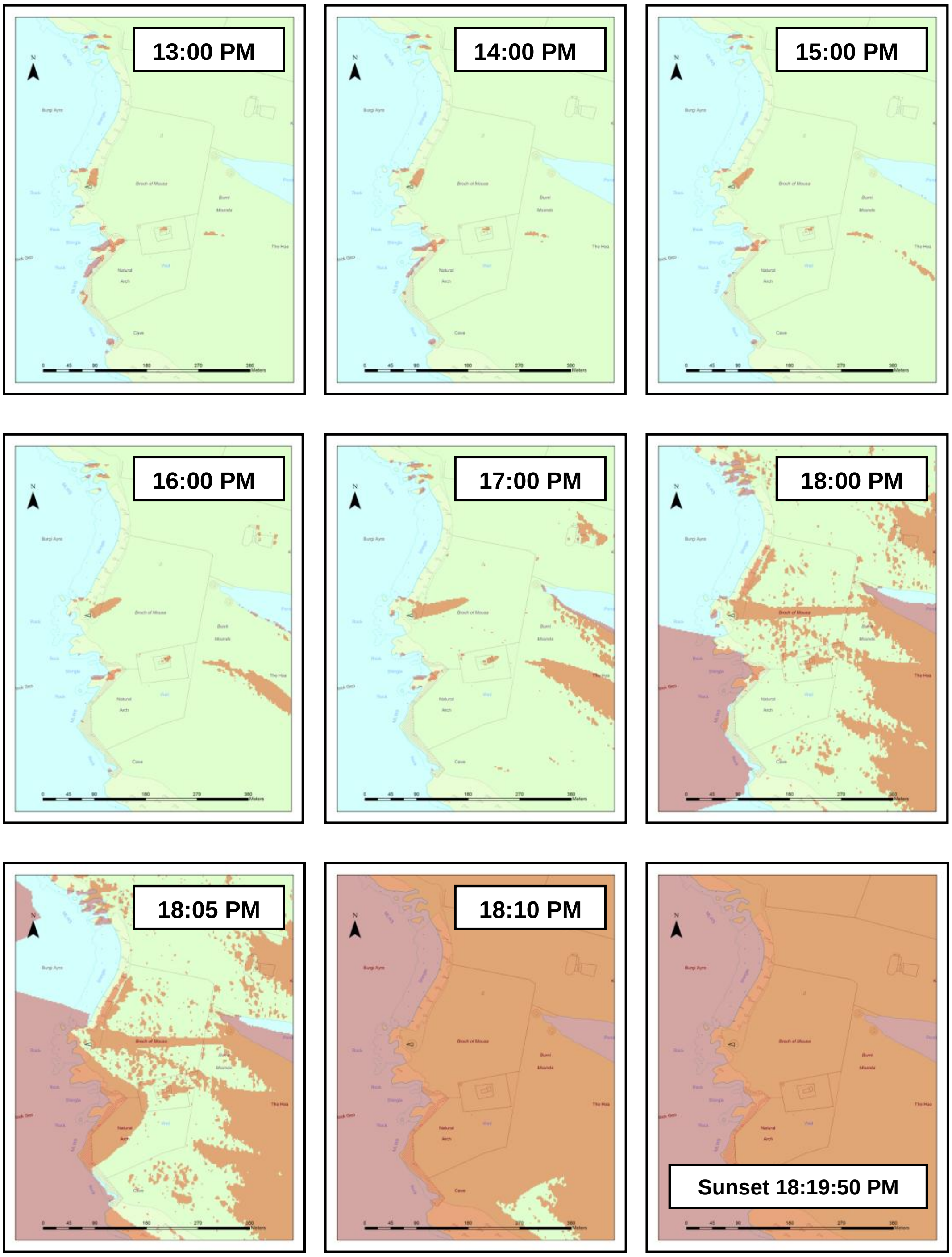


Figure 5.229. Sunrise (02:44:10 AM) to 10:00 AM around Mousa on the Summer Solstice (21st June). Red areas denote areas of shadow.

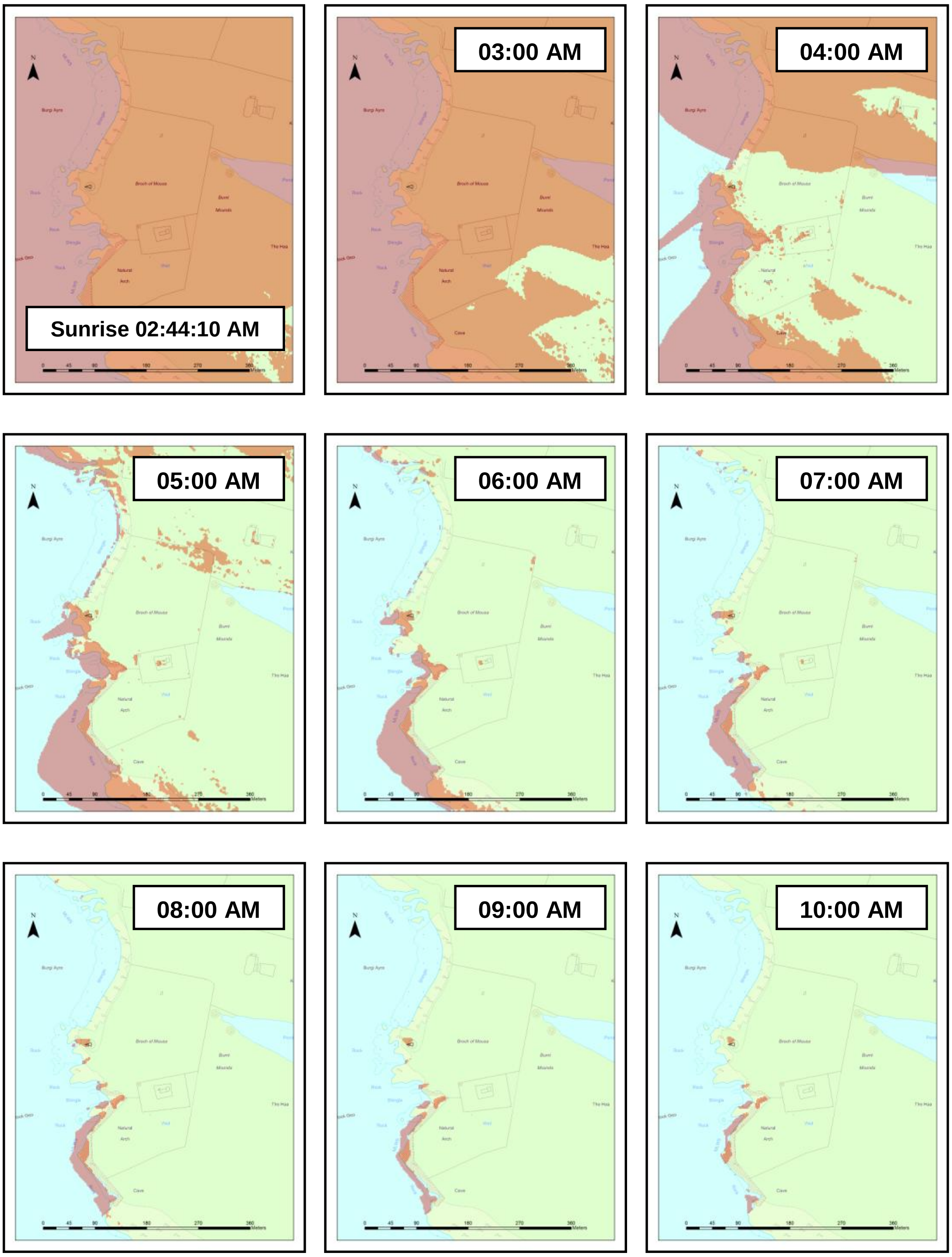


Figure 5.230. 11:00 AM to 19:00 PM around Mousa on the Summer Solstice (21st June). Red areas denote areas of shadow.

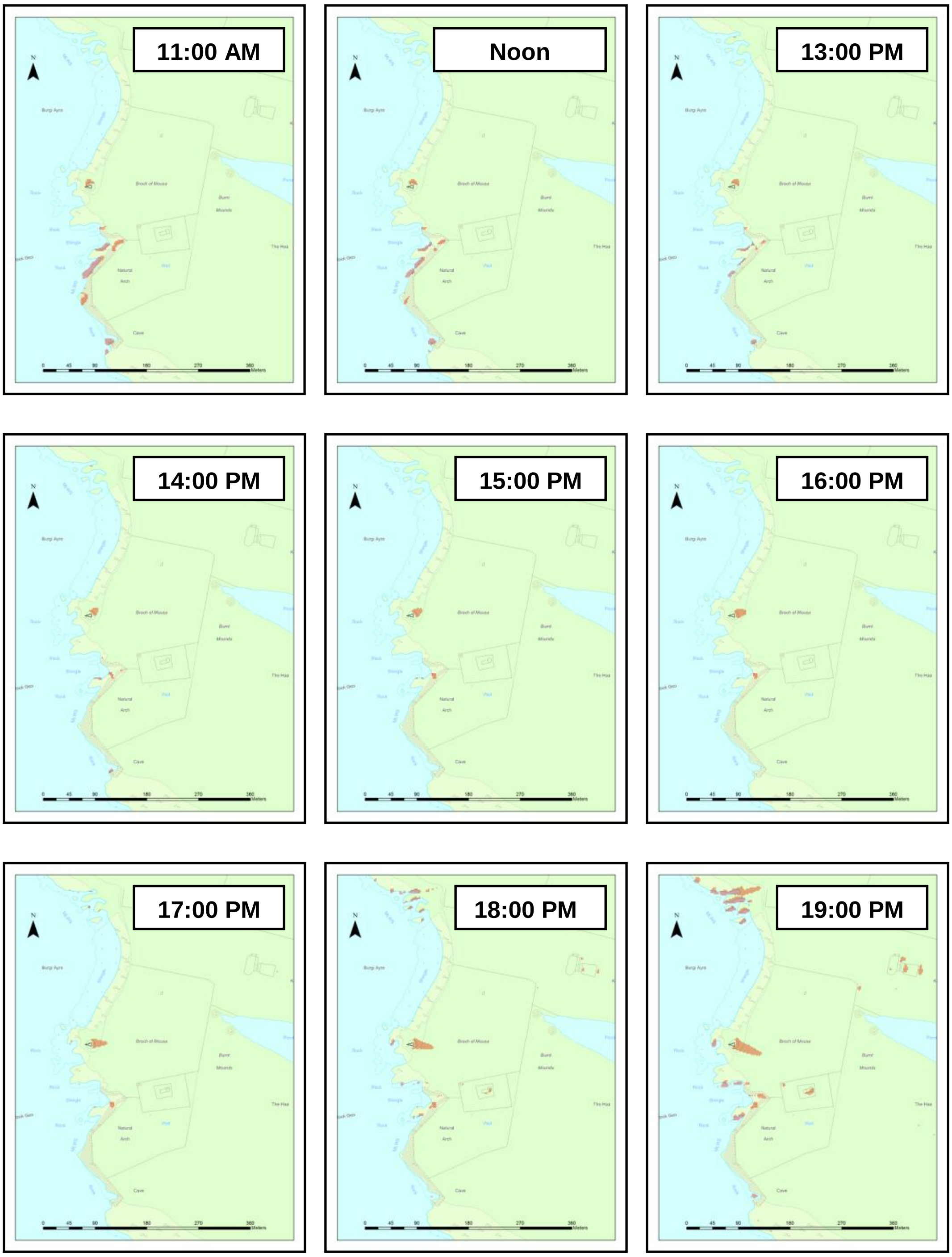
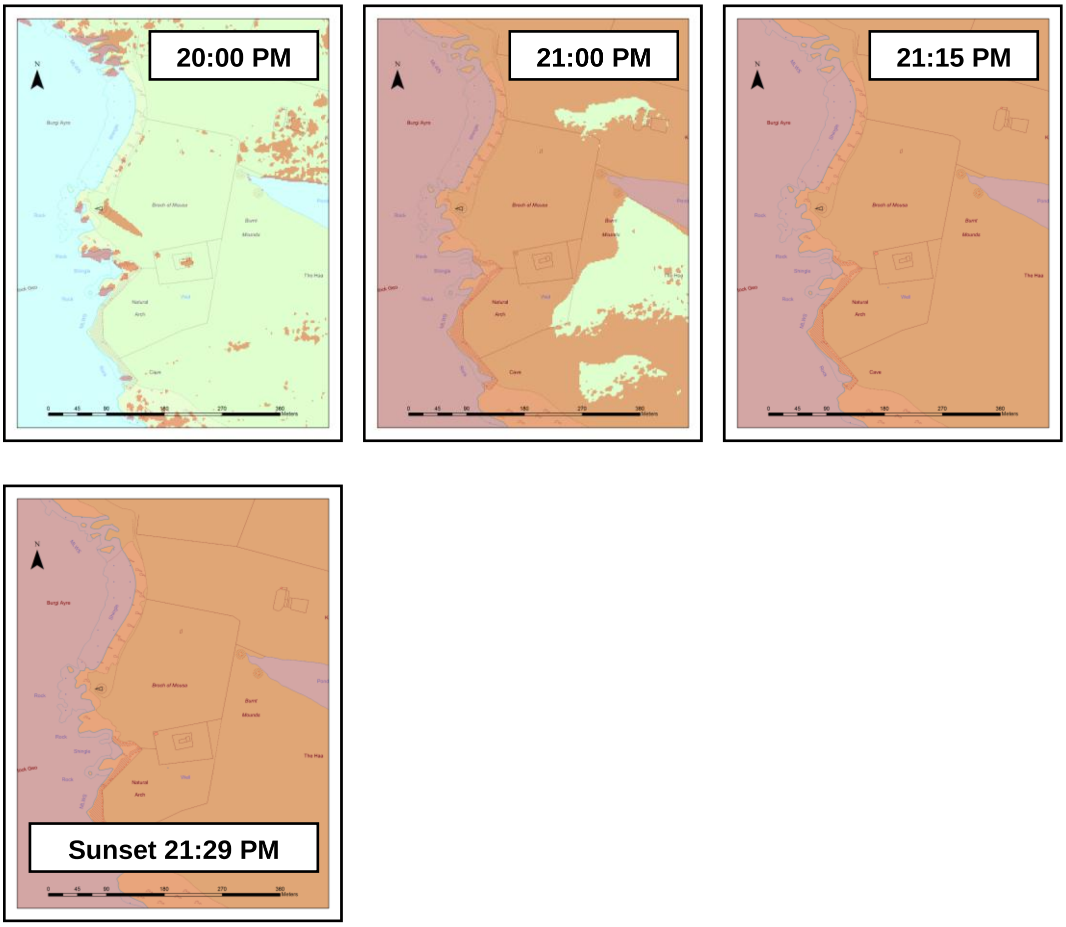


Figure 5.231. 20:00 PM to Sunset (21:29 PM) around Mousa on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 22: Sumburgh Airport; Old Scatness Broch.

Canmore ID: 556

Entrance: WNW

The Broch and its Landscape Context

The broch of Scatness (Figures 5.232, 5.233 and 5.234) stands on the south-western headland of Shetland, and would have presumably been one of the first brochs to be seen as a boat approached the islands from the south. Following survey work during the construction of Sumburgh Airport in 1995 (Dockrill, Turner and Bond 1995), subsequent excavations revealed a complex and extensive multi-period site here (Figure 5.234; Bond 1998; Dockrill 1998; Dockrill, Turner and Bond 1997; 1998; 1999; Dockrill, Bond, Turner, Brown, Bashford, Cussans and Nicholson 2010; Dockrill, Outram and Batt 2006); something which seems unsurprising when considering how the site overlooks the south-western approach to Shetland itself. Like the other brochs that are in lowland areas near the coast, it has good views of the sea (Figure 5.235), and possesses a particular good view of the Bay of Quendale, which would have been an ideal place to land a boat. Though it doesn’t have views of Jarlshof, which was doubtless a powerful neighbour to the east of Scatness, it does have fairly good views to the north and west towards the Broch of Toab, which lies on higher ground.

The Winter Solstice – Figures 5.236 and 5.237

Scatness is odd in that its entrance faces WNW, a very rare orientation in Northern Scotland. It may be that this orientation was selected because it faces the Bay of Quendale, which would have been the most practical place to land a boat on first siting Shetland. It may have thus been significant. However, with regards to light availability, the entrance would not have received direct sunlight at midwinter at all, as the sun sets in the SW during the solstice. A SE orientation would not have sufficed at any rate, as the broch does not receive direct light until around 10:00 AM, nearly an hour after sunrise. It is interesting that a SW orientation was not selected like it tended to be for so many other brochs in Shetland, as the sun shines directly on the SW side of the broch until only a few minutes before sunset, at 14:45 PM. It may be that a SW orientation was not chosen due to the exposed location of this broch, and the prevailing

SW winds coming off the sea here. Nevertheless, a due west orientation would have been better, and would not have been affected by the wind so much.

The Equinox (21st March) – Figures 5.238 and 5.239

The broch does not receive direct light at sunrise, and it is not until around 07:00 AM that it does. As the sun sets in the west, the entrance would receive limited sunlight in the spring and autumn, however it would receive sunlight around the last couple of hours of the day. For Scatness, the broch receives direct sunlight until near sunset, like in winter, and so the entrance would receive direct sunlight, though a SW or SE entrance would have been better suited.

The Summer Solstice (21st June) – Figures 5.240, 5.241 and 5.242

As the entrance faces WNW, only in the summer would it be directly illuminated. At sunrise, the broch remains in shadow, but by 04:00 AM it is in the sunlight and remains so for the rest of the day. At 21:00 PM, the landscape begins to fall into shadow. Interestingly, at 21:15, less than fifteen minutes before sunset, the broch is one of the last places in the landscape of southern Shetland to remain in light, retaining sunlight until only a few minutes before sunset, suggesting that this position and orientation may have been chosen to capture this light at the end of the day on the summer solstice.

Conclusion

Overall, the orientation is not suited for the winter, and would not have received much light during these months. In spring and autumn, it would have received a little light in the late afternoon, but in the summer, would have received the last light of the day towards the late afternoon and early dusk. An eastern orientation would have lost the first hour or so of light in the day throughout the year, and an orientation towards the SW would have faced the prevailing winds which would have been prevalent on this south-western headland. However, an orientation towards the west or east would have been better with regards to gaining light and avoiding wind. This suggests that this orientation was either meant for the summer months alone, or it was intended to face the Bay of Quendale (see Figure 5.233), for whatever purpose.

Figure 5.232. Sumburgh Airport Broch.
Photograph taken by myself, from the WNW entrance.

Figure 5.233. View through the WNW entrance of Sumburgh Airport.

Figure 5.234. Ground Plan of the Iron Age buildings at Sumburgh Airport.

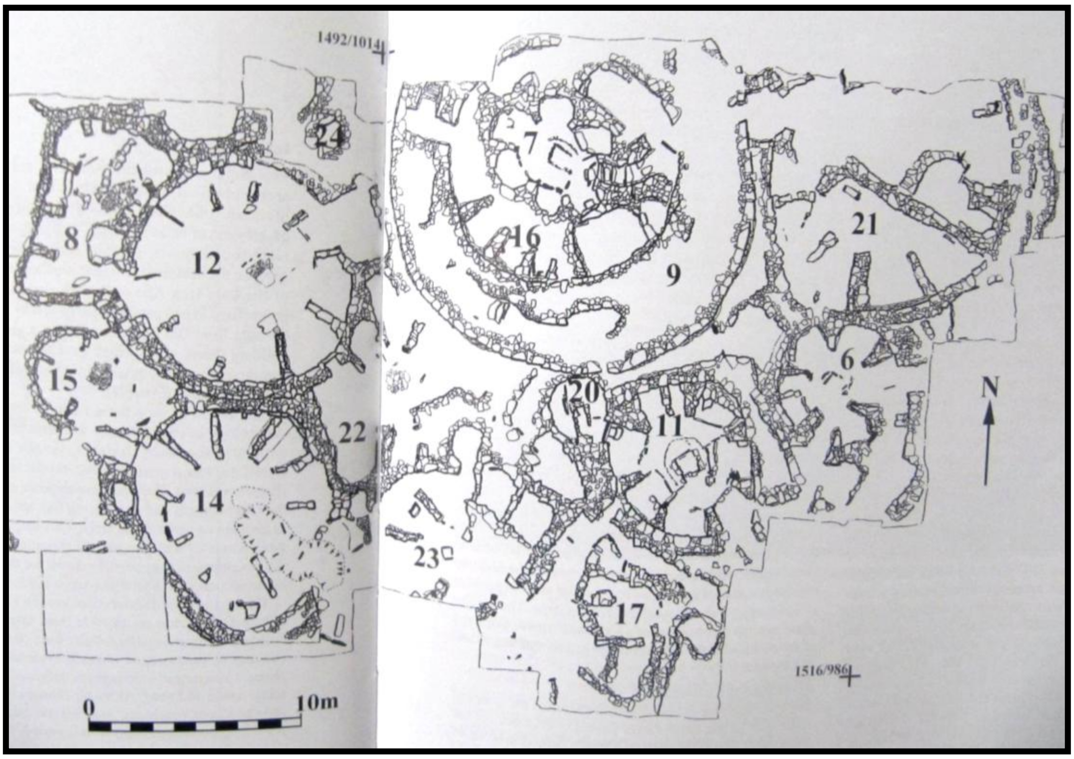


Figure 5.235. Multiple Viewsheds of Sumburgh Airport Broch.

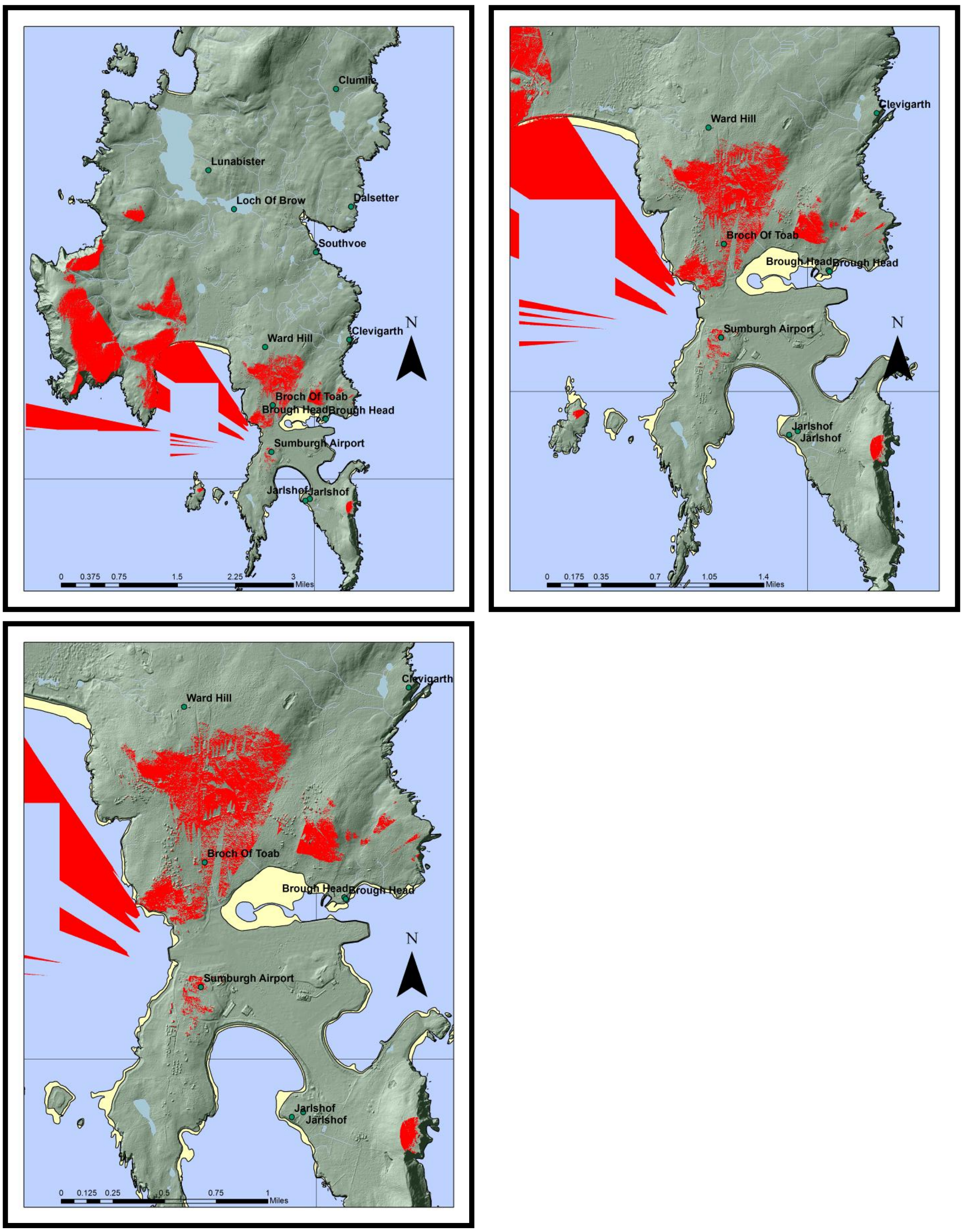


Figure 5.236. Sunrise (09:10 AM) to 14:30 PM around Sumburgh Airport on the Winter Solstice (21st December). Red areas denote areas of

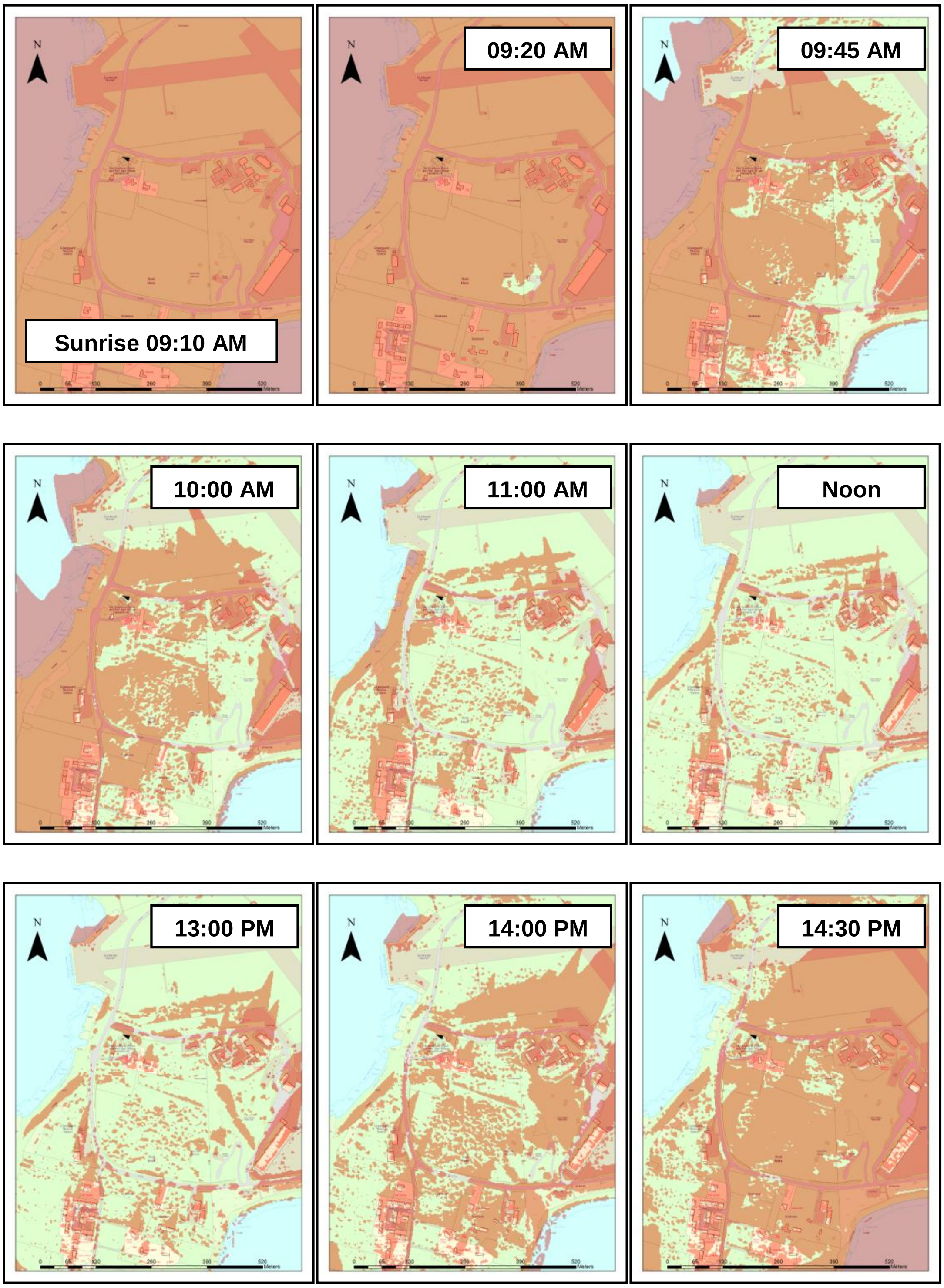


Figure 5.237. 14:45 PM to Sunset (14:55:45 PM) around Sumburgh Airport on the Winter Solstice (21st December). Red areas denote areas of shadow.

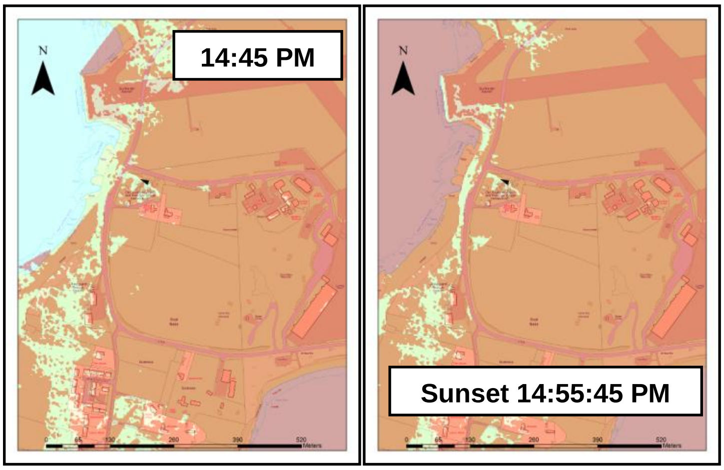


Figure 5.238. Sunrise (06:05:10 AM) to Noon around Sumburgh Airport on the Spring Equinox (21st March). Red areas denote areas of shadow.

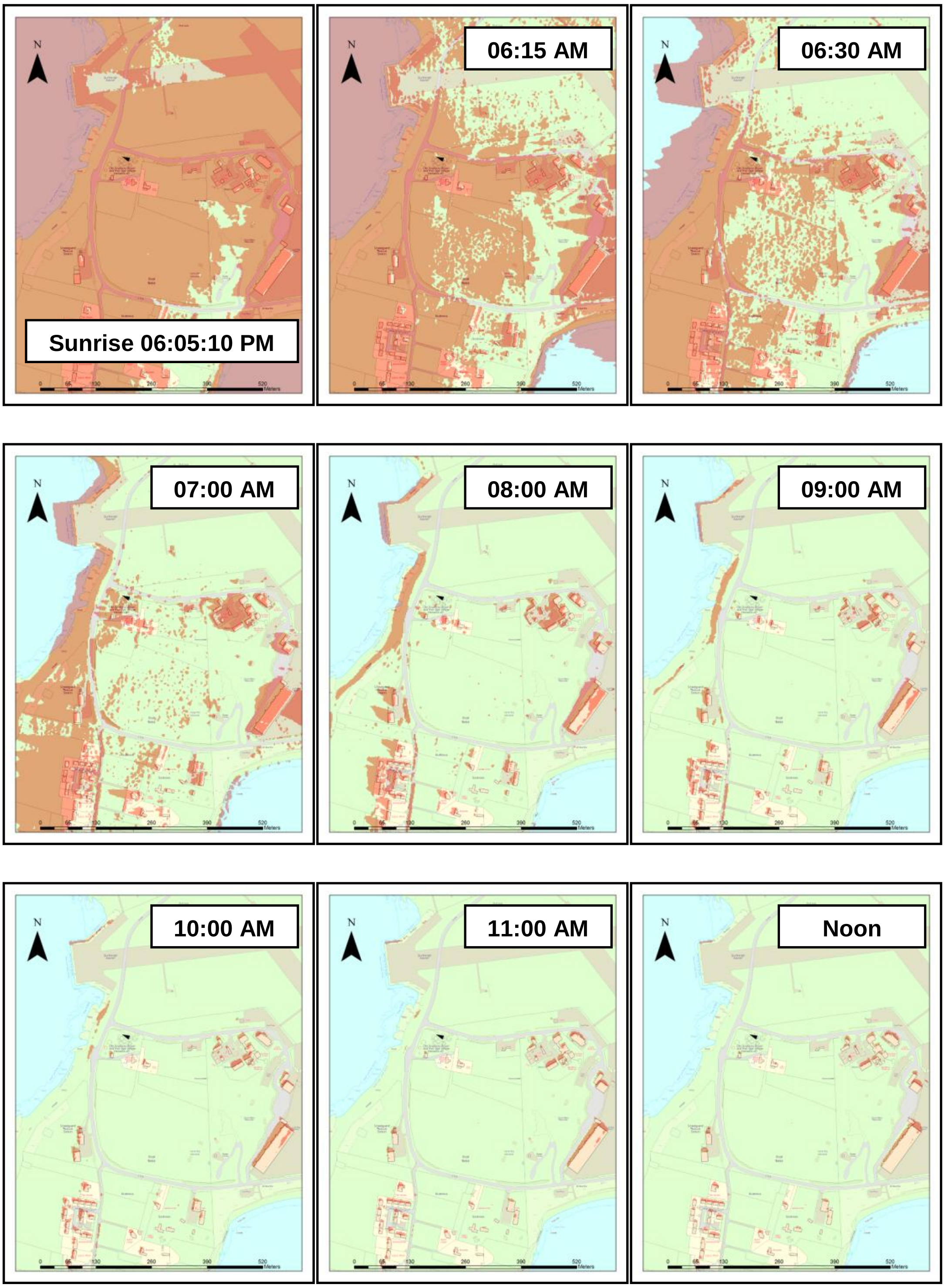


Figure 5.239. 13:00 PM to Sunset (18:29:50 PM) around Sumburgh Airport on the Spring Equinox (21st March). Red areas denote areas of shadow.

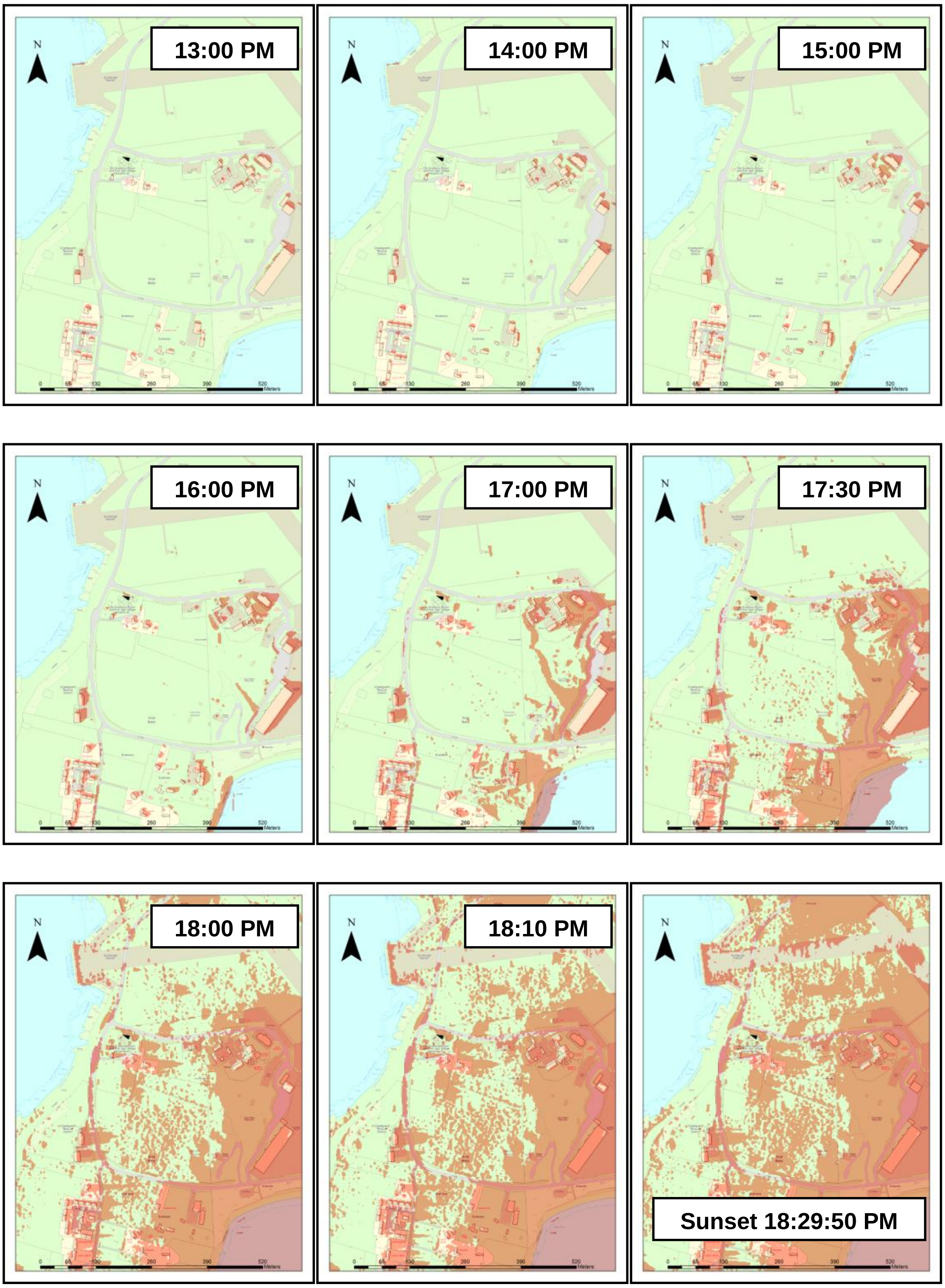


Figure 5.240. Sunrise (02:44:10 AM) to 10.00 AM around Sumburgh Airport on the Summer Solstice (21st June). Red areas denote areas of

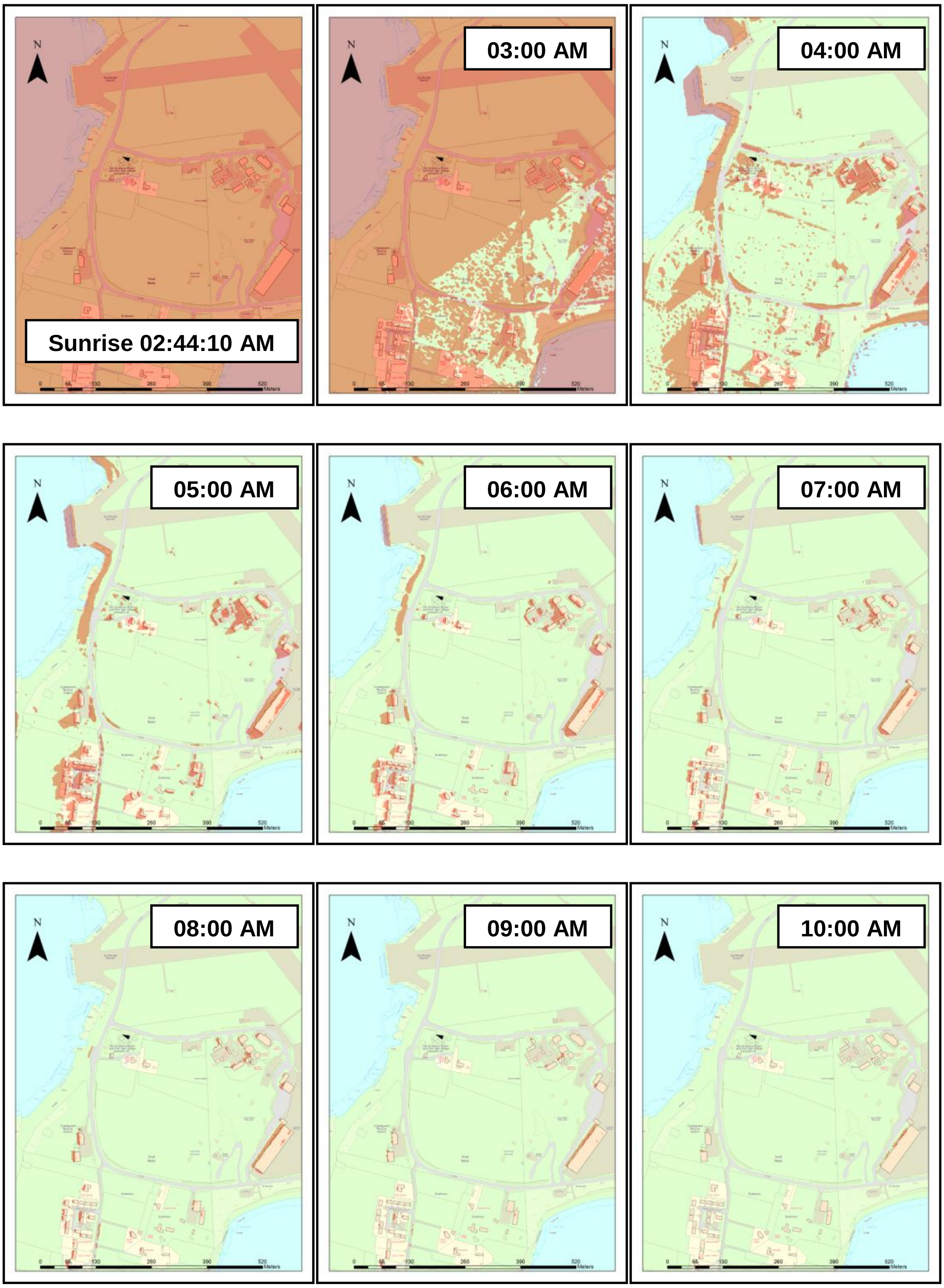


Figure 5.241. 11:00 AM to 19:00 PM around Sumburgh Airport on the Summer Solstice (21st June). Red areas denote areas of shadow.

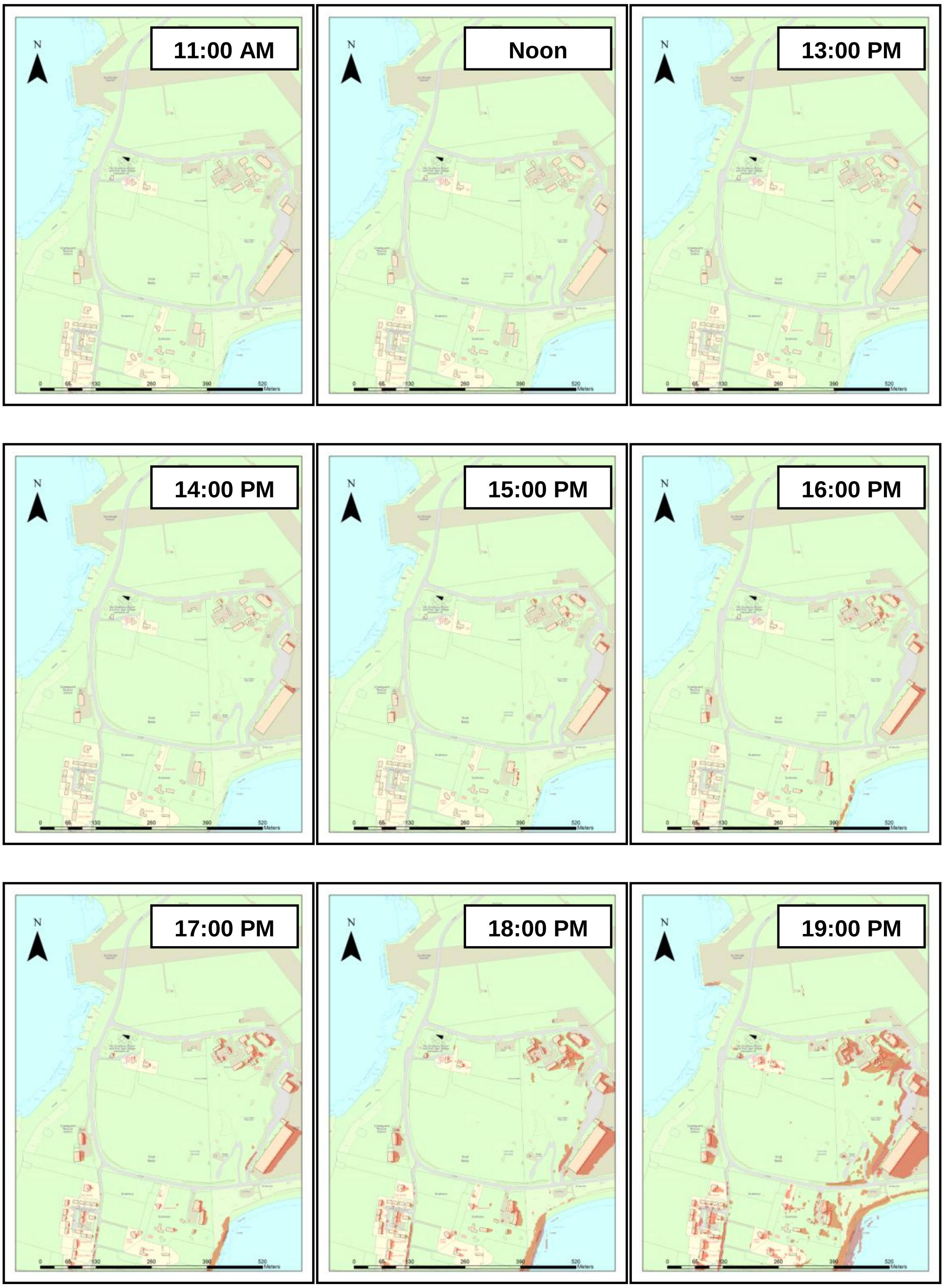
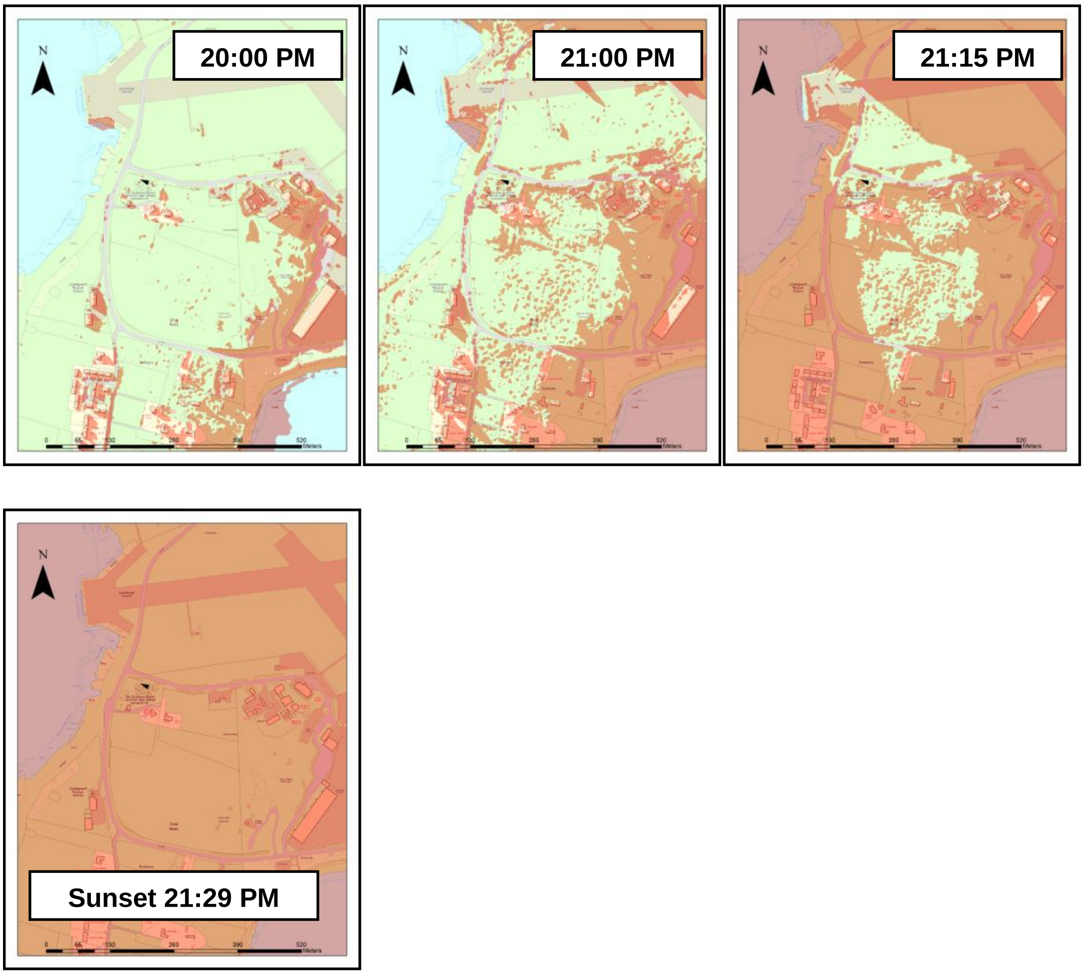


Figure 5.242. 20:00 PM to Sunset (21:29 PM) around Sumburgh Airport on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 23: Loch Of Snabrough

Canmore ID: 66

Entrance: NW

The Broch and its Landscape Context

This unexcavated broch, on a low-lying promontory on the shore of the Loch of Snabrough, stands on rolling cultivable land in an open and exposed position. As such, it has wide views not only down towards the southern entrance of Yell Sound (thereby making itself very noticeable to any boat entering the sound), but also has views down much of the north-west coast of Shetland Mainland (Figure 5.243). Indeed, its views extend at least 20 miles south across the sea towards Whalsay; and even has line-of-sight towards two brochs on Whalsay: Brough and Salt Ness. Possessing good views of Northern Yell, it lacks any view of the brochs there, though it does possess a view towards Underhoull broch, just over a mile away from the site.

The Winter Solstice (21st December) – Figures 5.244 and 5.245

The broch is strange as it faces the NW (RCAHMS 1946: 133); ill suited with regards to direct light for the vast majority of the year. During the winter months, this entrance would have gained no direct sunlight, and probably very little ambient light at all. The broch's SE side gains light within twenty minutes after sunrise, and the broch and its landscape retains light for much of the remaining day. The broch only loses light after 14:30 PM; at most only twenty minutes before sunset. For the winter then, an entrance towards the SE or SW would have been far better, and would have gained direct sunlight throughout the day.

The Equinox (21st March) – Figures 5.246 and 5.247

Again, the NW entrance would have gained little light throughout this time of year. The broch's eastern side gains light about twenty minutes after sunrise, and the landscape and broch retain light for much of the day. By 18:10 PM, about ten minutes before sunset, the broch's western side is still in direct sunlight, losing it before the sun sets however. For the equinoxes then, a western entrance would have gained almost the maximal light available for this latitude. Nevertheless, the NW entrance would have permitted little direct light during this period.

The Summer Solstice (21st June) Figures 5.248, 5.249 and 5.250

It is only during the midsummer period that this broch's entrance would have held some direct sunlight. The broch gains direct light within the first twenty minutes, retaining it for the day. Between 19:00 PM and 20:00 PM, the entrance would have then gained direct sunlight; this being the only time of the year in which it does. The broch and its NW side would have retained this light until between 21:15 PM and 21:30 PM, when the broch finally falls into the shade.

Conclusion

This broch is in a very open location, thereby receiving direct sunlight throughout the day, throughout the year. The decision to orientate NW, which doesn't benefit the site throughout the majority of the year, may suggest that the summer solstice was significantly marked in its entrance, and that the direct light from the setting sun during this time of year was the only direct light wished for within the broch structure. The NW entrance may also hint at seasonality (i.e. that the site may have only been occupied for specific times of the year), something we see at other loch-side brochs (e.g. Burga Water(1)); though it may simply have been an easier means of access to the structure, facing away from the loch as it does.

Figure 5.243. Multiple Viewsheds of Loch of Snabrough Broch.

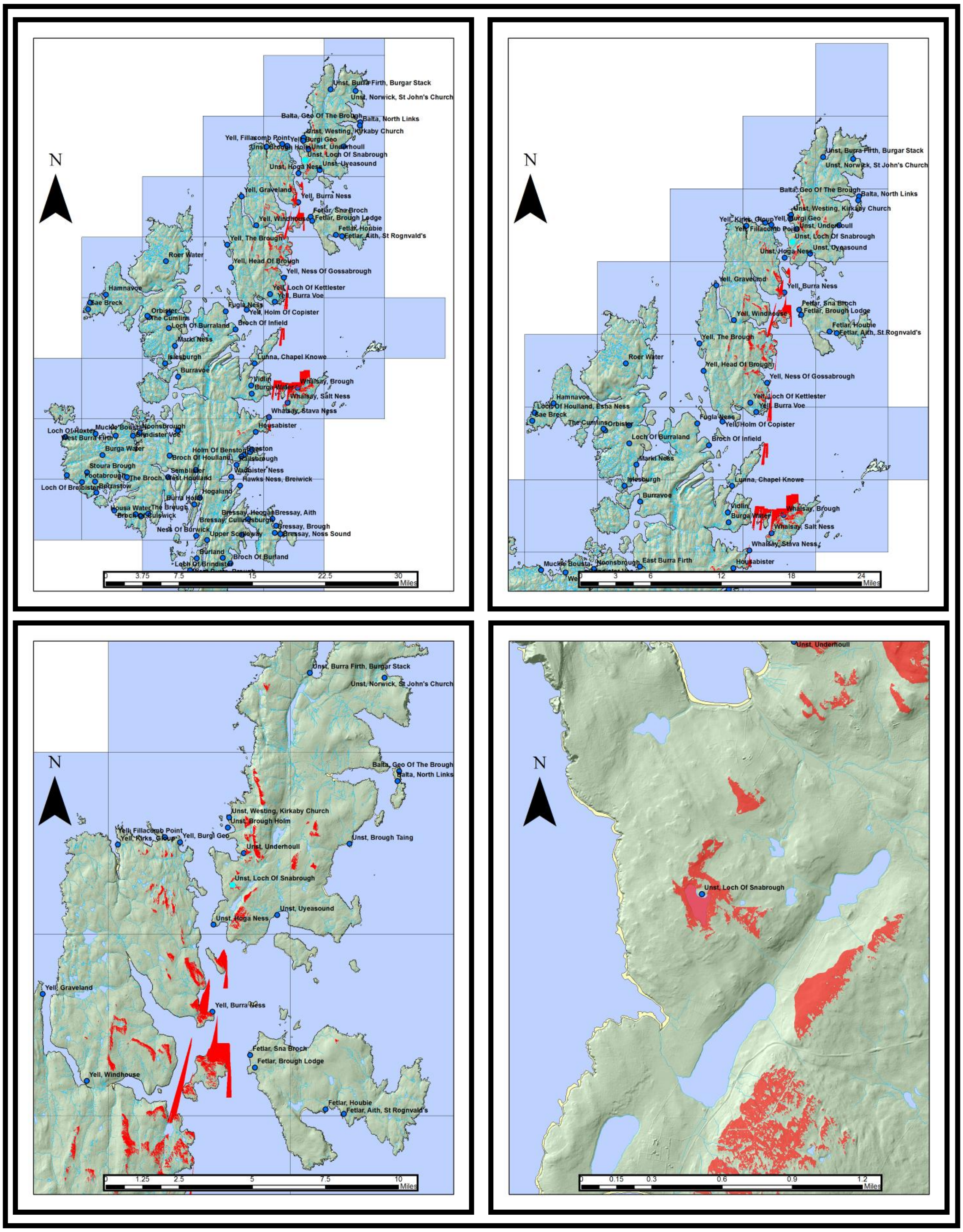


Figure 5.244. Sunrise (09:16 AM) to 14:00 PM around Loch of Snabrough on the Winter Solstice (21st December). Red areas denote areas of

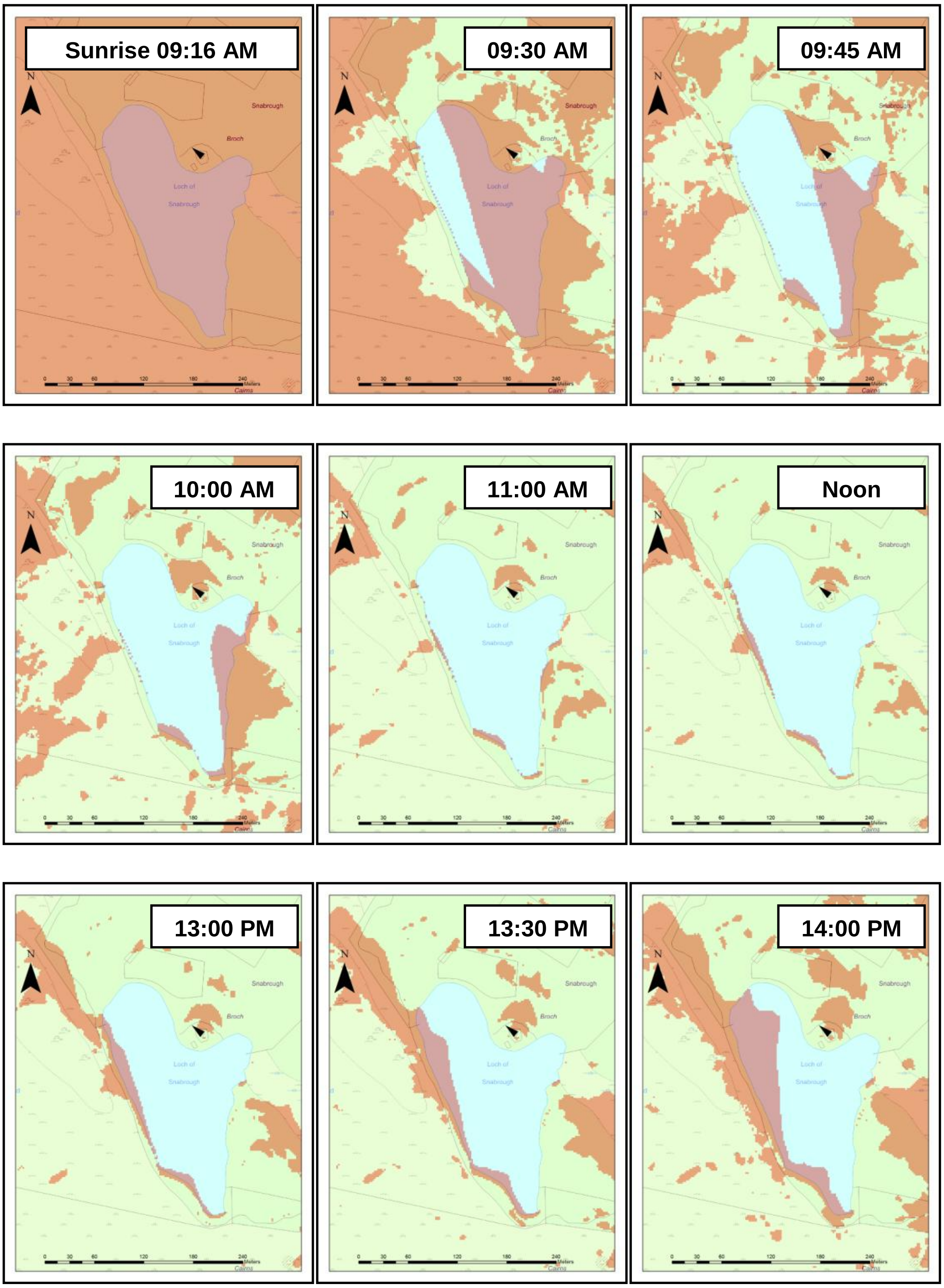


Figure 5.245. 14:15 PM to Sunset (14:49:50 PM) around Loch of Snabrough on the Winter Solstice (21st December). Red areas denote areas

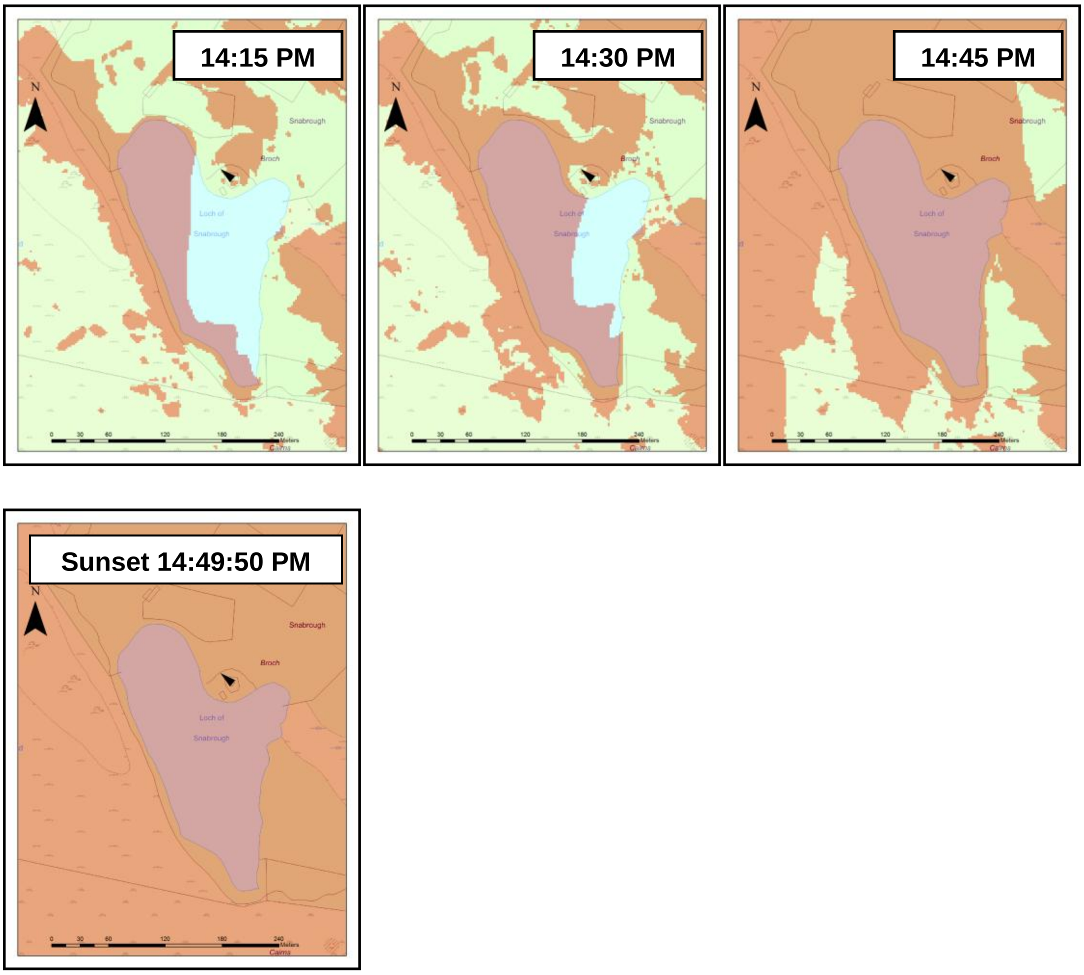


Figure 5.246. Sunrise (06:04:45 AM) to Noon around Loch of Snabrough on the Spring Equinox (21st March). Red areas denote areas of shadow.

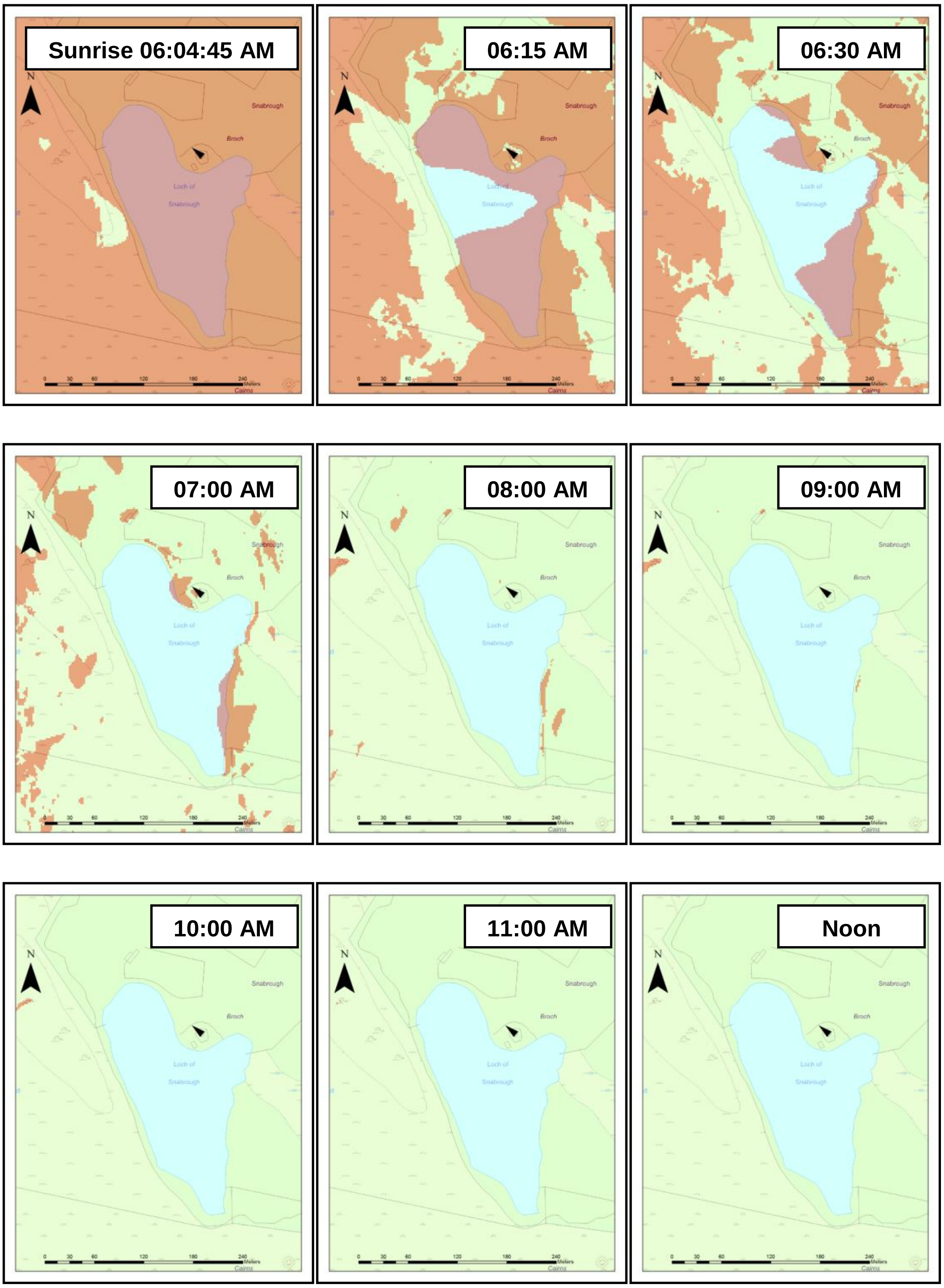


Figure 5.247. 13:00 PM to Sunset (18:19:45 PM) around Loch of Snabrough on the Spring Equinox (21st March). Red areas denote areas of

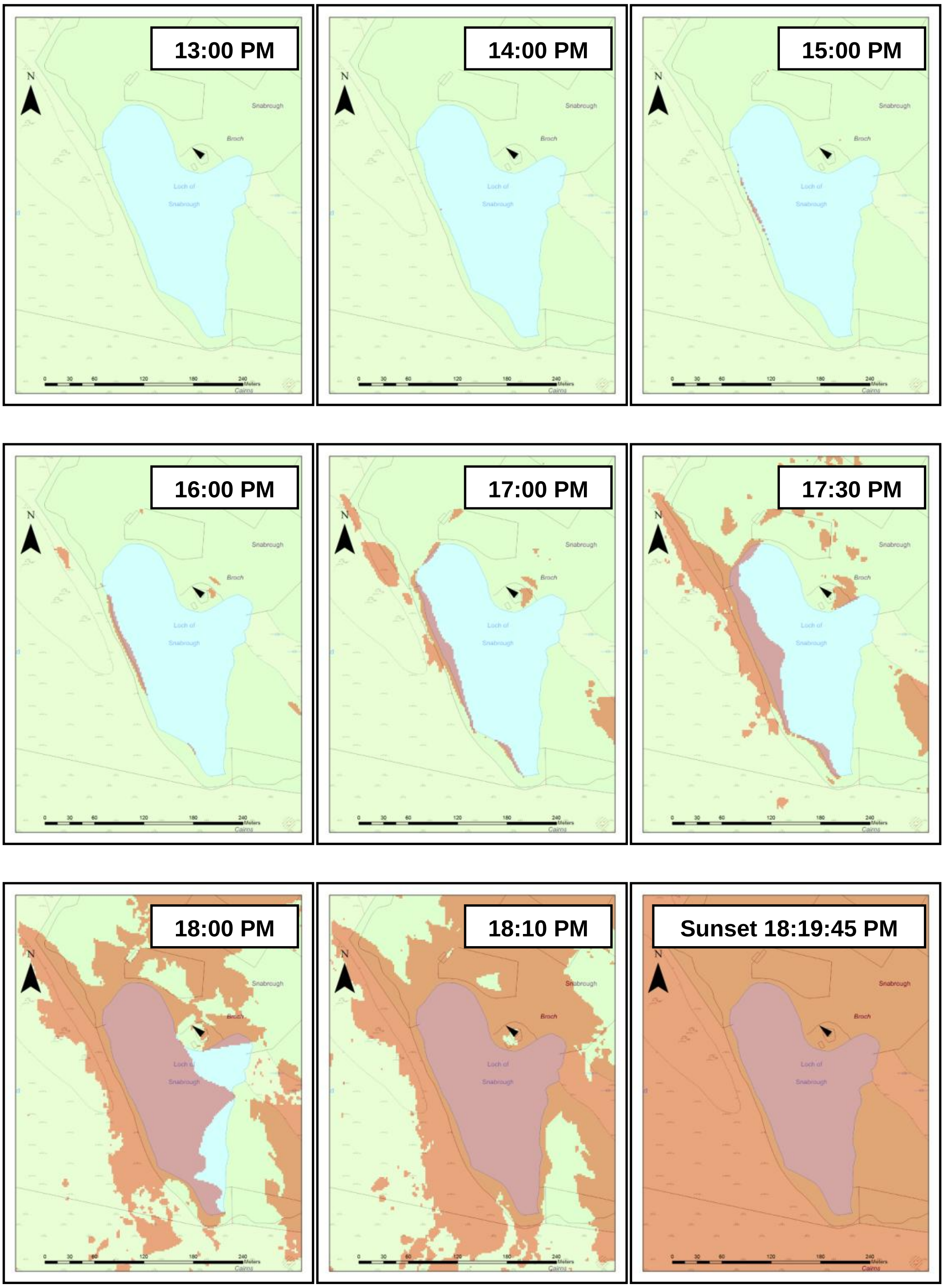


Figure 5.248. Sunrise (02:36:50 AM) to 08:00 PM around Loch of Snabrough on the Summer Solstice (21st June). Red areas denote areas of

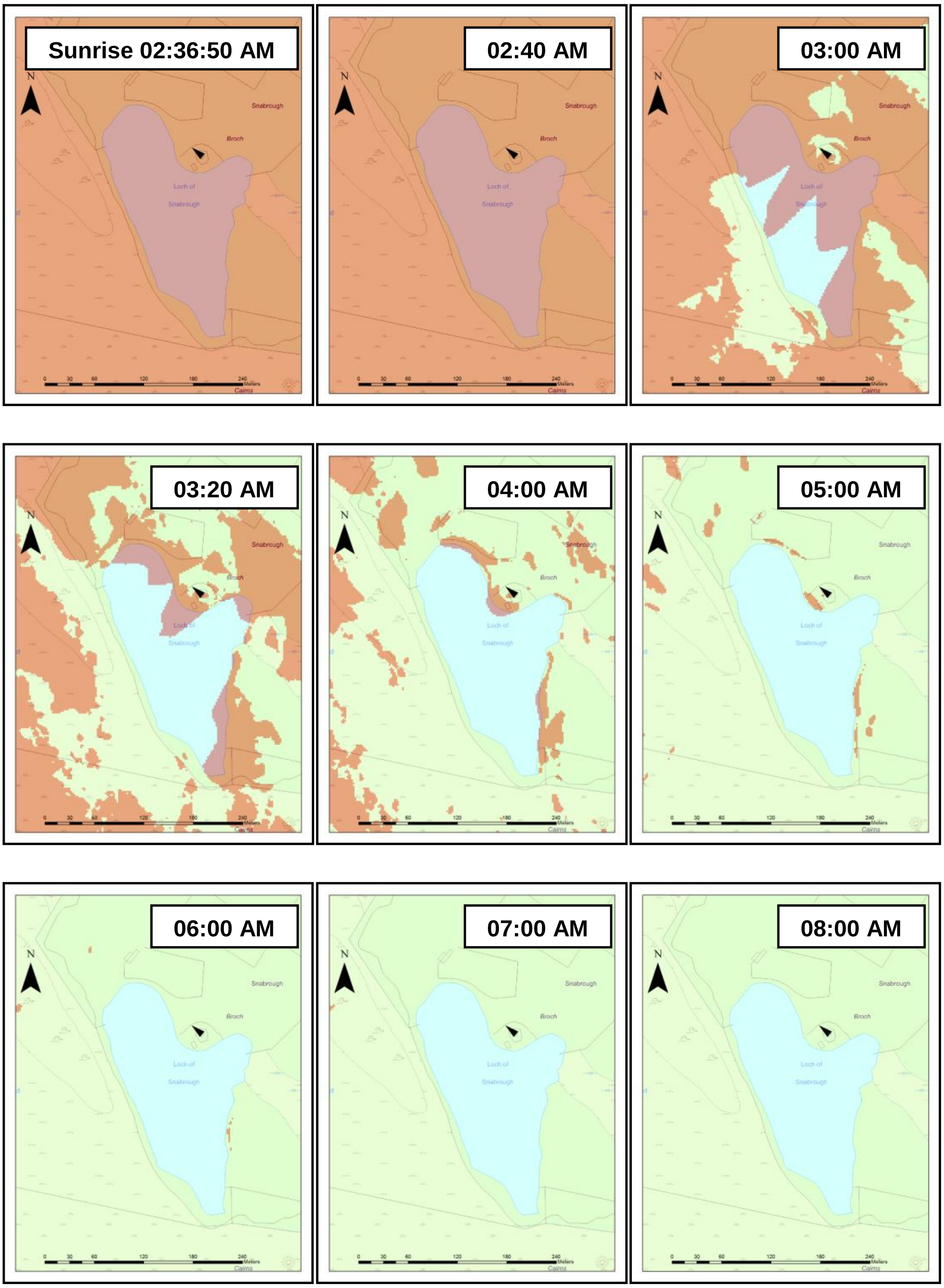


Figure 5.249. 09:00 AM to 17:00 PM around Loch of Snabrough on the Summer Solstice (21st June). Red areas denote areas of shadow.

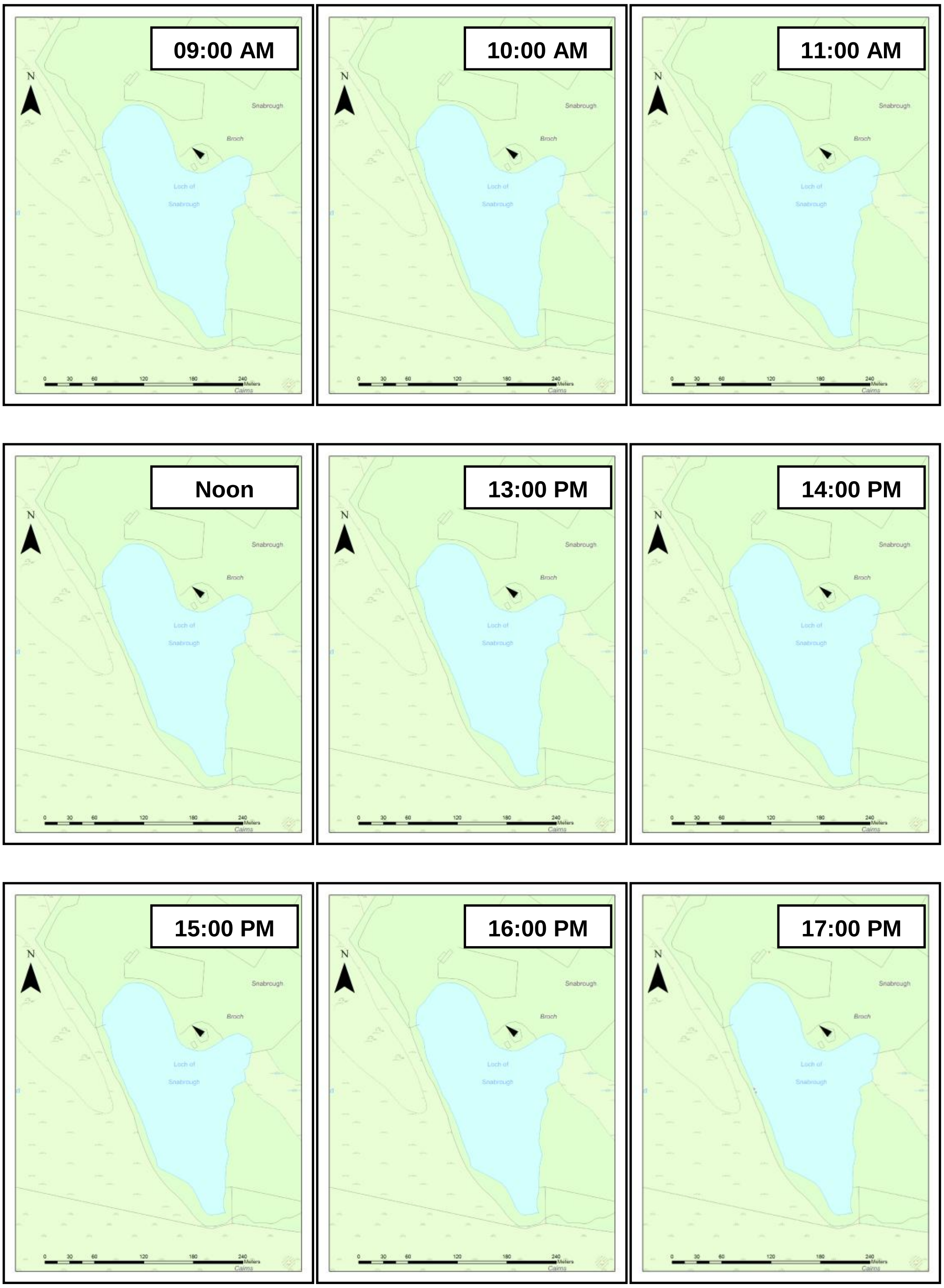
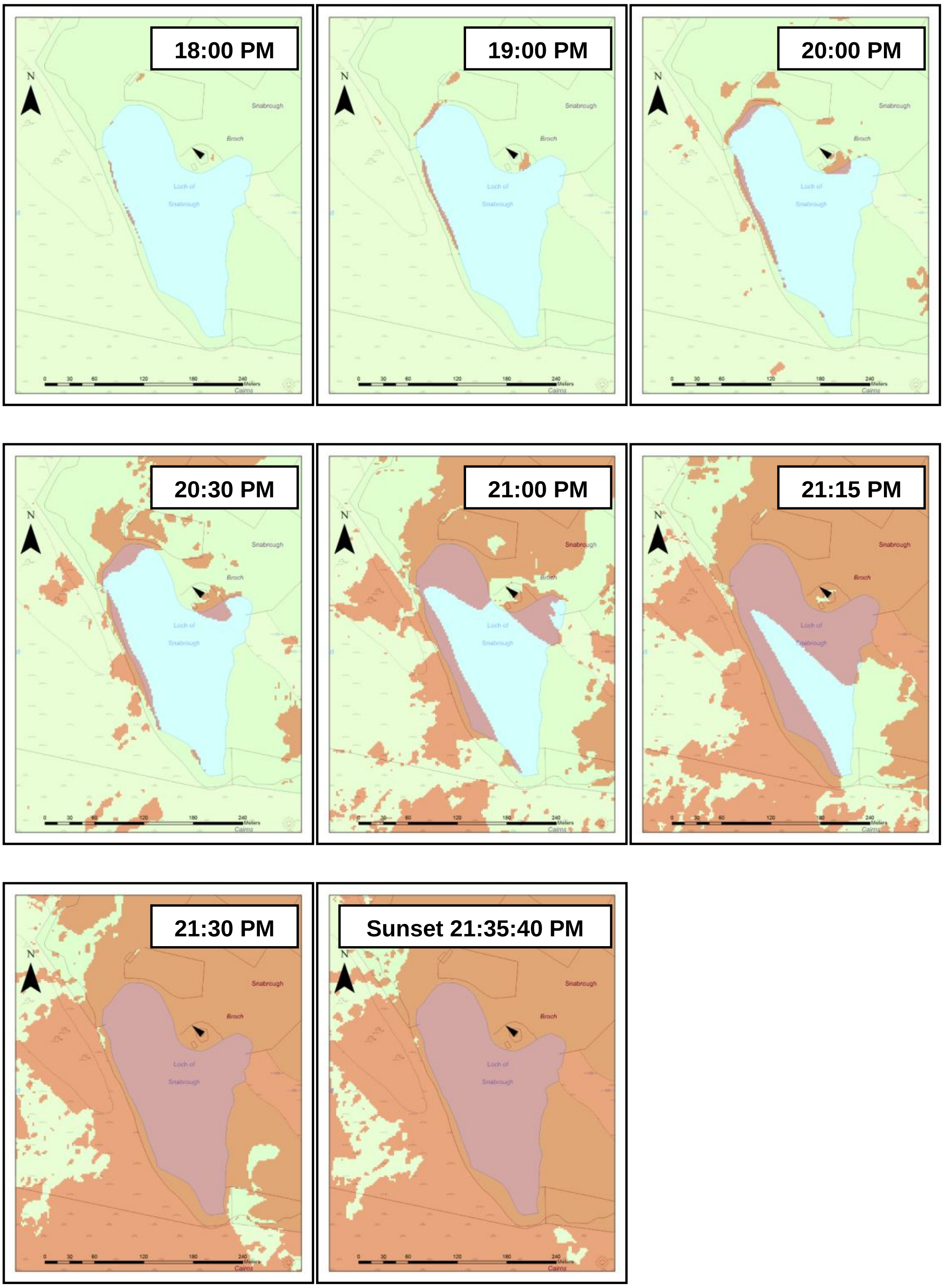


Figure 5.250. 18:00 PM to Sunset (21:35:40 PM) around Loch of Snabrough on the Summer Solstice (21st June). Red areas denote areas of



Shetland: Interpretation and Discussion

Table 5.1. Comparison between Actual and Optimum Broch Orientations in Shetland.

Broch	Broch Orientation	Optimum Orientation for Broch Location (for all year light availability)	Does the Broch Face the Light Optimum?
Loch Of Brindister	NNE	SE	No
Hawks Ness	NE	E	No
Levenwick	E	E/SE	Yes
Burga Water (2)	E	E/SE	Yes
Fugla Ness	E	E/SE	Yes
Sae Breck	E	W	No
The Brough	E	W/SW	No
St Rognvald's	E	E/SE	Yes
Clumlie	SE	SE	Yes
Burga Water (1)	S	S/SE	Yes
Burraland	SW	SE	No
Southvoe	SW	E/W	No
Clevigarth	SW	E/SE	No
Brough Head	SW	SW	Yes
Burland	SW	E/SE	No
Clickimin	SW	E	No
Hoga Ness	SW	E/SE	No
Underhoull	SW	W/SW	Yes
West Burra Firth	WSW	E/W	No
Loch Of Houlland	WSW	E/SE	No
Mousa	W	SW	No
Sumburgh Airport	WNW	E/W	No
Loch Of Snabrough	NW	E/W	No

What patterns can be derived from the data presented above? Out of a total of twenty-three brochs in Shetland, fifteen are not orientated towards the optimum direction for light availability throughout the year (as noted in Table 5.1); many of which face into the western arc. For some, the difference between the orientation optimum and the chosen orientation is actually very subtle. The broch of Mousa for example, with its western facing entrance, is not completely suited to all year light availability (with regards to winter), but it still receives much more light than an eastern facing entrance would have due to the hills located to the east of the broch. As a SE entrance would have gained more direct light only during the winter however, its western entrance does suggest a focus towards the spring/autumn/summer months only; suggestive, perhaps, of seasonality at Mousa – understandable when considering how difficult it is to cross over to Mousa Island from the Mainland during the winter. Another example is Sae Breck, whose eastern entrance loses only a few minutes direct sunlight in comparison to a possible western entrance, suggesting that an eastern entrance was preferred here.

For other brochs (especially those that face SW), the wind must have been a factor. Indeed, to declare that the wind is strong in Shetland is somewhat of an understatement, and to ignore the wind's ability to impact doorway orientation would be negligent. On this note, Burraland is located on a stretch of high cliffs which are dealt ferociously strong winds (as when I visited), and though its SW entrance loses slightly more direct light than a SE (ocean facing) orientation would have, this may simply reflect a desire to avoid the wind from the sea, while still retaining some light in winter. Likewise, Southvoe broch, facing SW, loses direct light which would be gained from a SE/E entrance. However, as it is located on the eastern coastline, this may simply reflect an avoidance of the wind, while also retaining the SW light for the winter. Clevigarth broch, likewise sitting on the eastern coast, avoids an entrance towards the E/SE, thus losing light. But again, its SW entrance is protected from the winds coming off the sea here, while savouring winter light. Loch of Houlland, facing SW, loses mere minutes of light which an eastern entrance would have saved. However, this again may reflect an avoidance of the wind, as a SE entrance would have faced directly down the loch, which is itself located within a shallow basin, thereby allowing wind to easily channel down it.

There are others however where the conclusion to be drawn is less certain. The Brough, for example, by facing E, misses out on what would have been a noticeable amount of the extra direct light which could have been gained from a western entrance. As the western side of this broch is also protected from harsh winds by hills to the west of the site, it suggests that the west was a direction to be avoided here, for whatever reason. Another, Burland, faces out to sea, towards the SW, and so would have been affected by both the prevailing winds and the strong winds coming off the sea. Hoga Ness is similar; with its SW entrance gaining about the same amount of direct light as a SE entrance would have done, but facing into the strong winds from the sea. Clickimin broch too, positioned away from the coastline, faces the SW, and loses a noticeable amount of direct light than a SE doorway would have done. However, it should be noted that a large SE facing block-house is located immediately outside the SE side of Clickimin broch (the purpose of which is unclear), and so a SE entrance would have probably lost light due to this structure blocking the light (if it was contemporary with the construction of the broch, that is). Therefore, Clickimin's SW entrance is somewhat logical, though we should bear in mind that its entrance passage is much longer than other brochs (such as Gurness or Mid Howe), and so very little natural light would have actually entered.

Other brochs are simply intriguing in their choice. For example, West Burra Firth faces WSW, and although the west would have gained more direct light than the east throughout much of the year, the SSE is the only area of the broch to gain direct light – between one and two hours – during mid-winter; and so its WSW entrance (gaining no light whatsoever in winter) strongly alludes to seasonality here. This idea may likewise be extended to other brochs in Shetland, such as Loch of Brindister, Hawks Ness and Loch of Snabrough, which are all focussed towards the midsummer sun only, thereby forfeiting light for much of the year. However, for the island broch of Loch of Brindister, with its NNE entrance, direct sunlight would not have entered at all throughout the year, and any other direction would have been better with regards to light. This suggests that for these sites, the requirement of sunlight was of little consequence, and that the orientation towards other – perhaps more subtle – foci was significant. Like the duns in the Argyll (Crowther 2011), a focus towards the summer solstice may have been significant too, with seasonality perhaps playing a role.

Bridging Gaps through Light: An Archaeological Exploration of Light and Dark in the Atlantic Scottish Iron Age

2 Volumes

Volume II

Thomas Crowther

Thesis submitted for the degree of PhD

Department of Archaeology
Durham University

October 2014

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Volume II

The Orkney Islands

Figure 5.251. Location of Orkney's Brochs with available entrances to be analysed. *(Hollow circles represent other brochs without available entrance data).*
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Broch No.	Site Name	Orientation
Broch 1	Howe Of Langskaill	ENE
Broch 2	East Broch Of Burray	E
Broch 3	Hillock Of Burroughston	E
Broch 4	Broch Of Gurness	E
Broch 5	Burrian Broch	E
Broch 6	Knowe Of Redland	E
Broch 7	Loch Of Ayre	ESE
Broch 8	Howe Of Hoxa	ESE
Broch 9	Rousay, Scockness	SE
Broch 10	Broch Of Lingro	SE
Broch 11	Bu	SE
Broch 12	Broch Of Burrian	SE
Broch 13	Manse Of Harray	SE
Broch 14	Broch Of Borwick	SE
Broch 15	Munkerhoose	SE
Broch 16	Howie of The Manse	SE
Broch 17	The Howe	SE
Broch 18	Dingy's Howe	SE
Broch 19	Riggin Of Kami	SSW
Broch 20	Ingshowe	SW
Broch 21	Midhowe	W
Broch 22	Oxtro	W
Broch 23	Lamb Head	NW

Broch 1: Howe of Langskaill

Canmore ID: 3022

Entrance: ENE

The Broch and its Landscape Context

Excavated in 1862 (RCAHMS 1946: 243; see also Card and Downes 2001), this broch is located upon a small hillock and no views of the coast or of other brochs (Figure 5.252), though it does possess views to the south and east. Any approach from the bays to the east would probably have been seen however.

The Winter Solstice – Figures 5.253 and 5.254

The site would have gained direct light very soon after sunrise, however due to the northern orientation, the entrance would not have gained much direct light. The site and its immediate surroundings retain light until around half an hour before sunset.

The Equinox (21st March) – Figures 5.255 and 5.256

Again, as the sun rises, the broch would have gained direct light about half an hour after sunset, though the entrance would have received a limited amount during the morning. By 06:30 AM, the landscape around the broch is in sunlight, and remains so for much of the day, losing it in the last fifteen minutes before sunset. A western entrance would thus have been more suitable during this period.

The Summer Solstice (21st June) Figures 5.257, 5.258 and 5.259

Fifteen minutes after the sun rises, at 03:00 AM, the north eastern entrance receives direct sunlight, though much of its surrounding landscape remains in shadow. But by 04:00 AM the majority of the landscape is in the sunlight, and remains so for the day. Between 20:30 and 20:45 PM, the broch falls into shadow, about twenty minutes before sunset.

Conclusions

With its north-eastern orientation, the entrance would have received direct sunlight in the early morning from around April to September. However, the site receives ample amounts of sunlight throughout the year, and so would have benefited more from a due east or western entrance.

Figure 5.252. Viewshed of Howe of Langskaill.

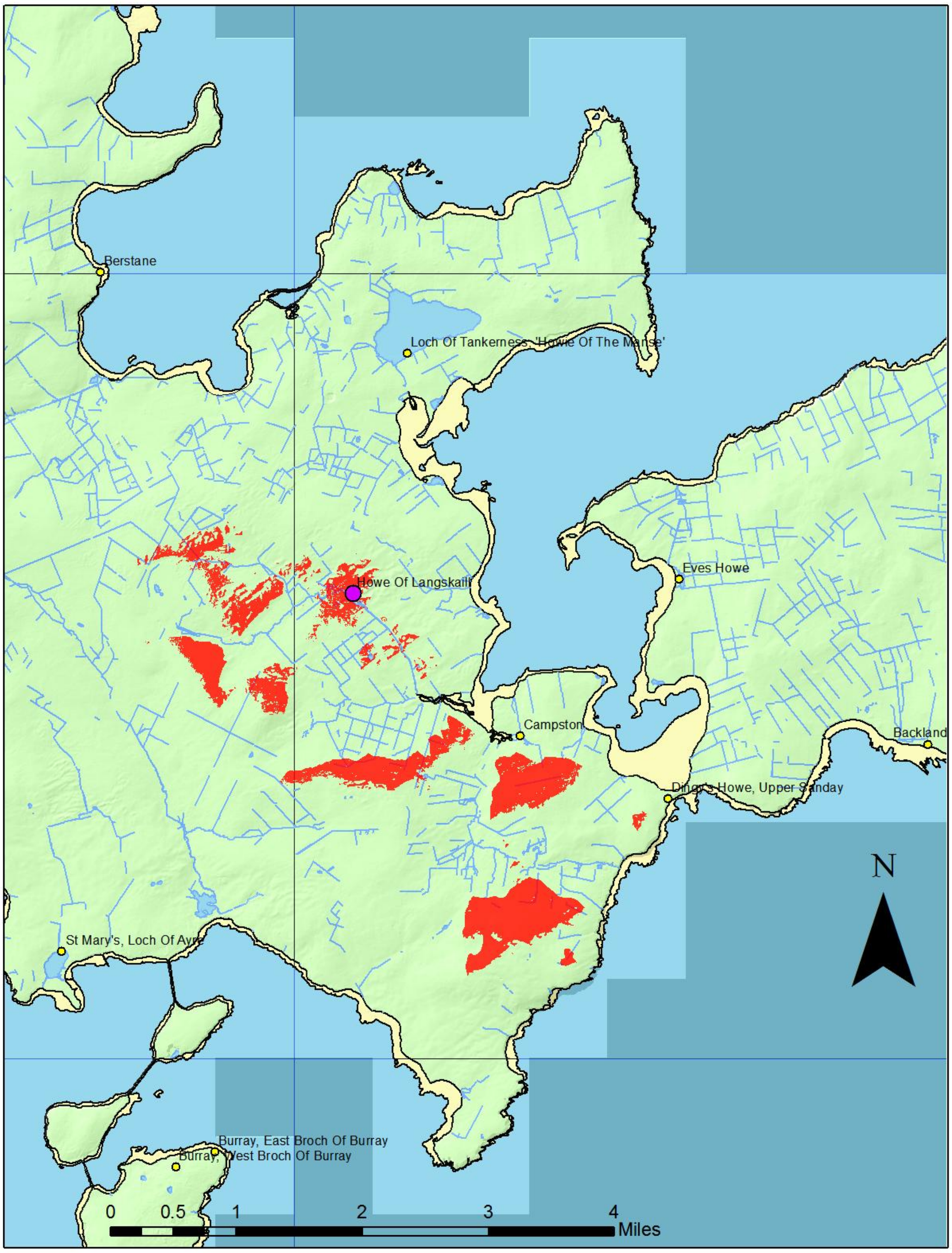


Figure 5.253. Sunrise (08:44 AM) to 13:00 PM around Howe of Langskaill on the Winter Solstice (21st December). Red areas denote areas of shadow.

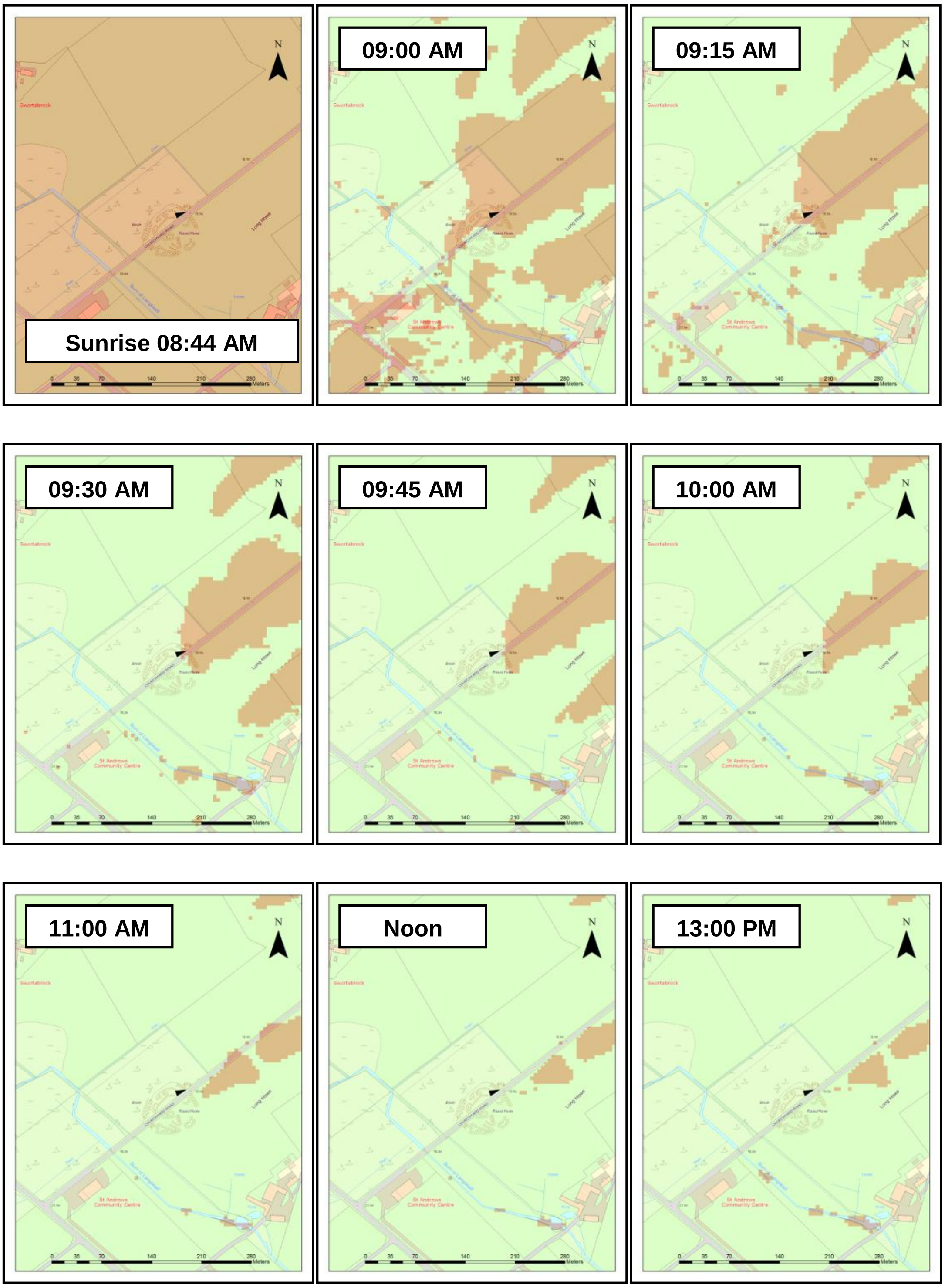


Figure 5.254. 13:30 PM to Sunset (14:47 PM) around Howe of Langskaill on the Winter Solstice (21st December). Red areas denote areas of

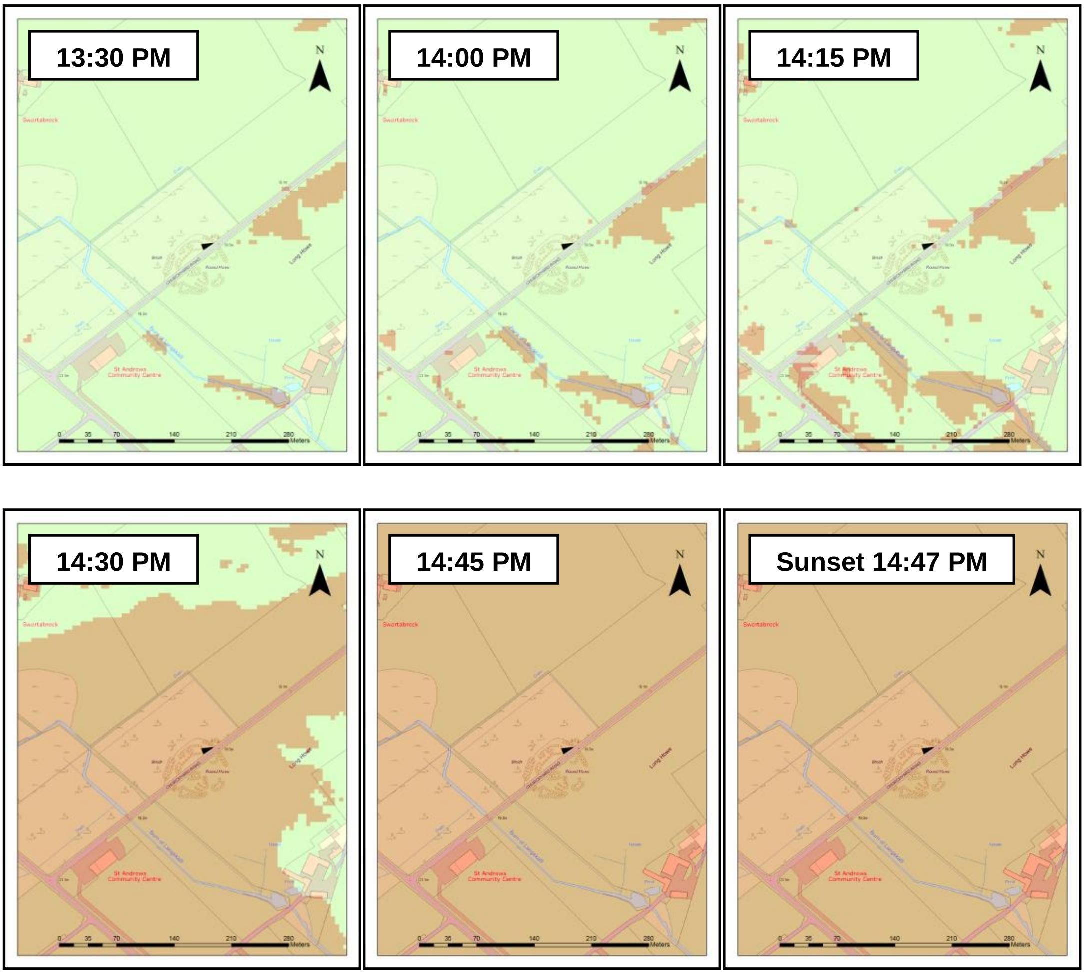


Figure 5.255. Sunrise (05:48 AM) to 11:00 AM around Howe of Langskaill on the Spring Equinox (21st March). Red areas denote areas of shadow.

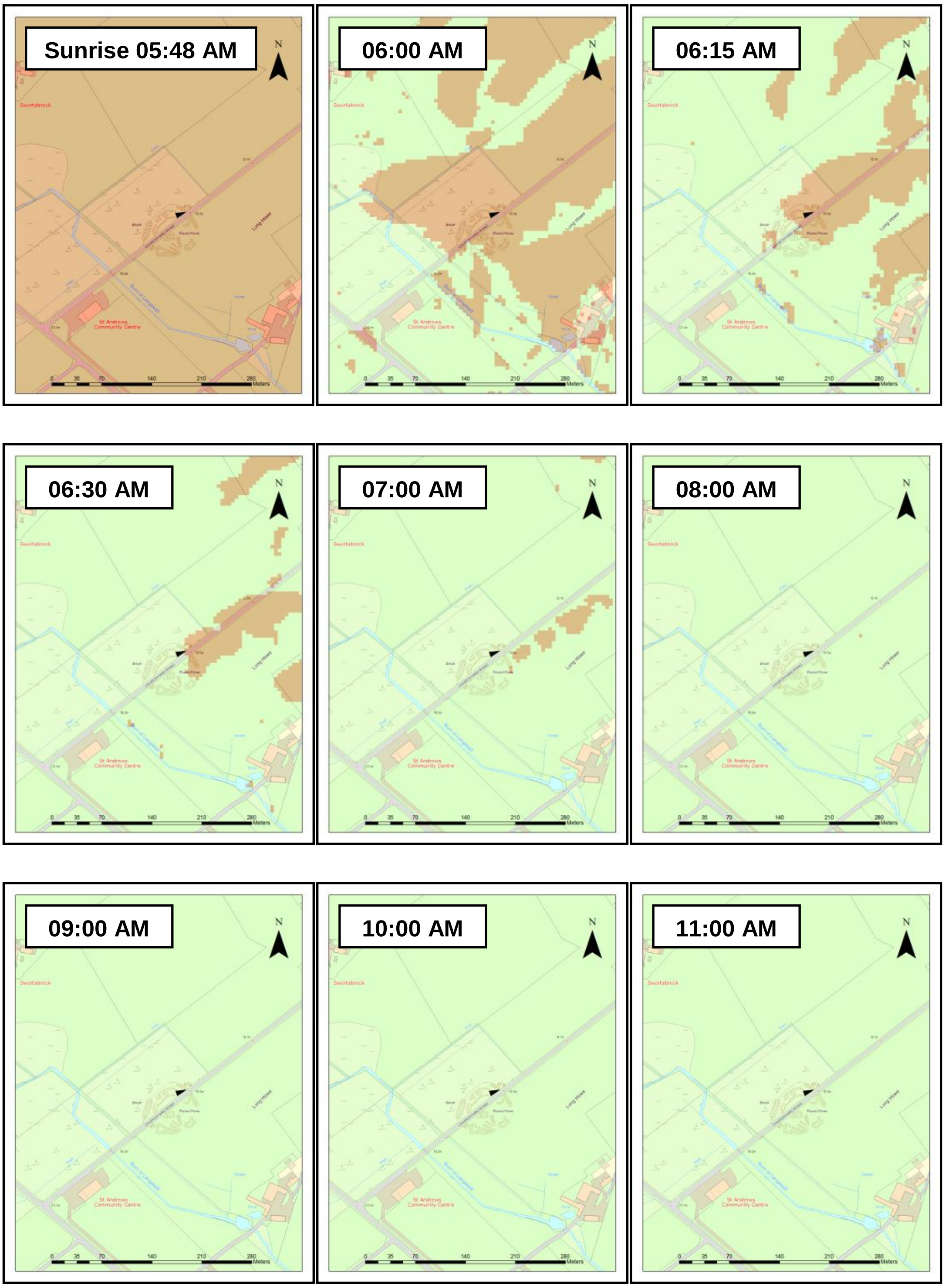


Figure 5.256. Noon to Sunset (18:02:15 PM) around Howe of Langskaill on the Spring Equinox (21st March). Red areas denote areas of shadow.

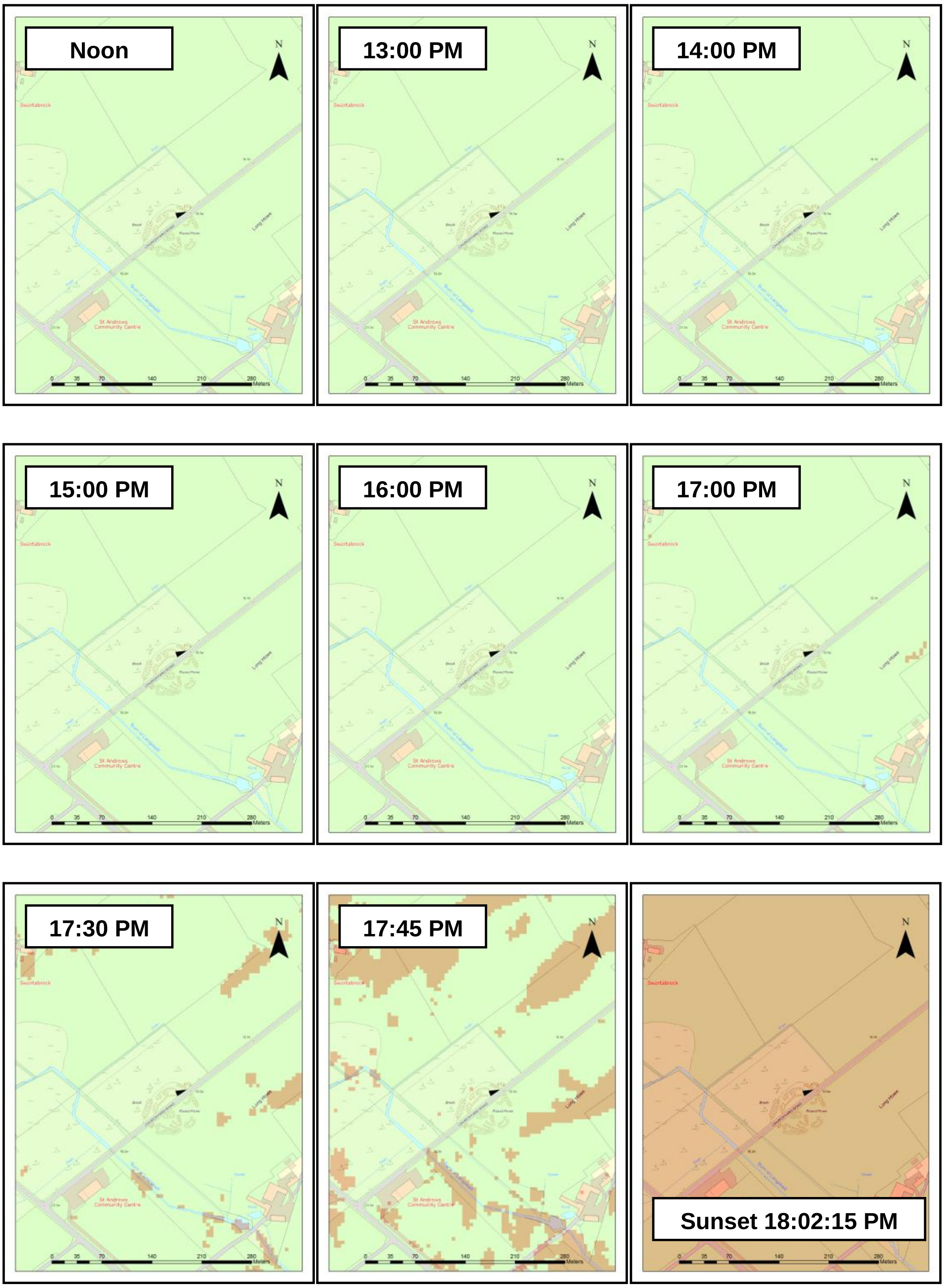


Figure 5.257. Sunrise (02:36:40 AM) to 08:00 AM around Howe of Langskaill on the Summer Solstice (21st June). Red areas denote areas of shadow.

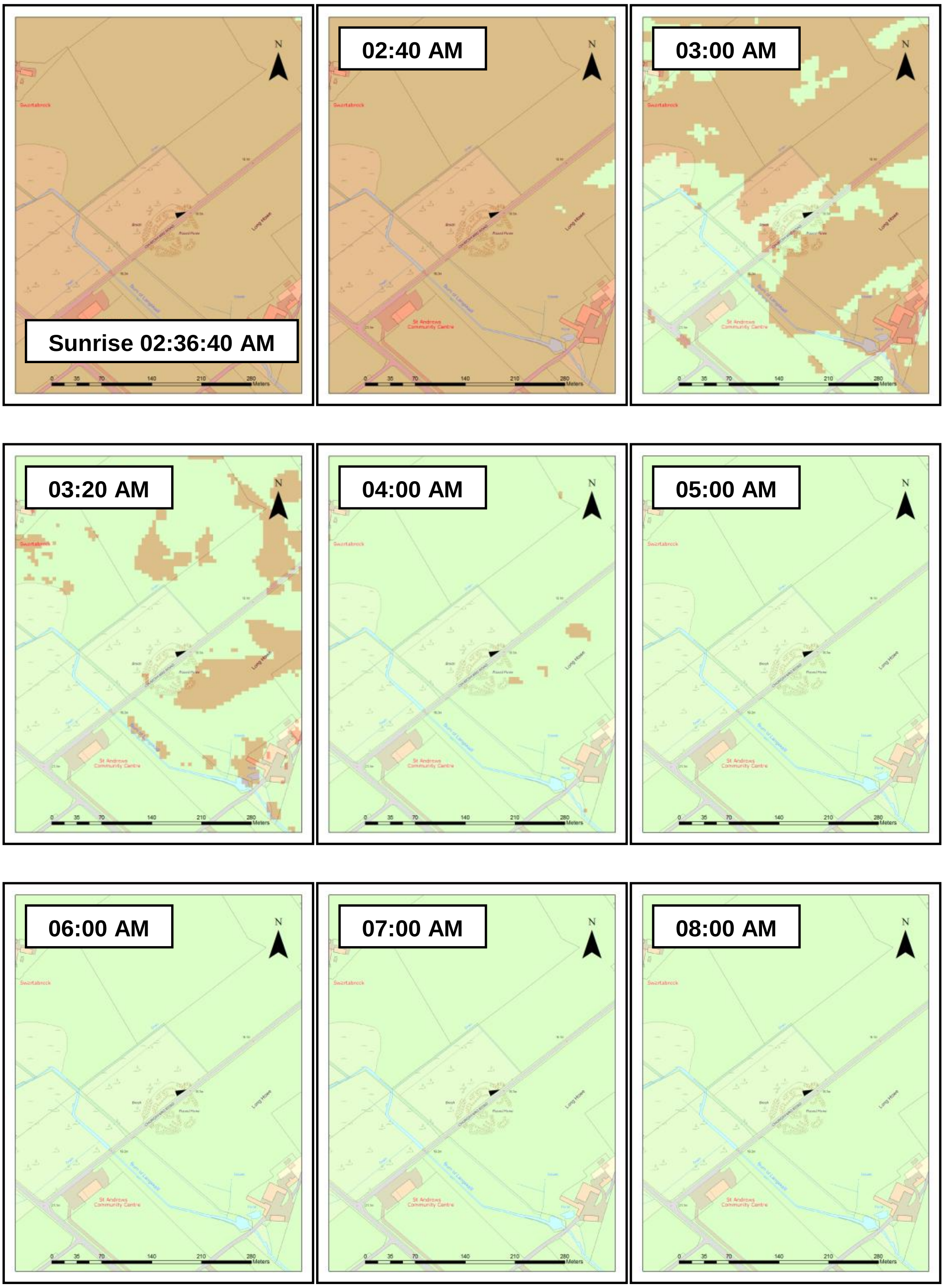
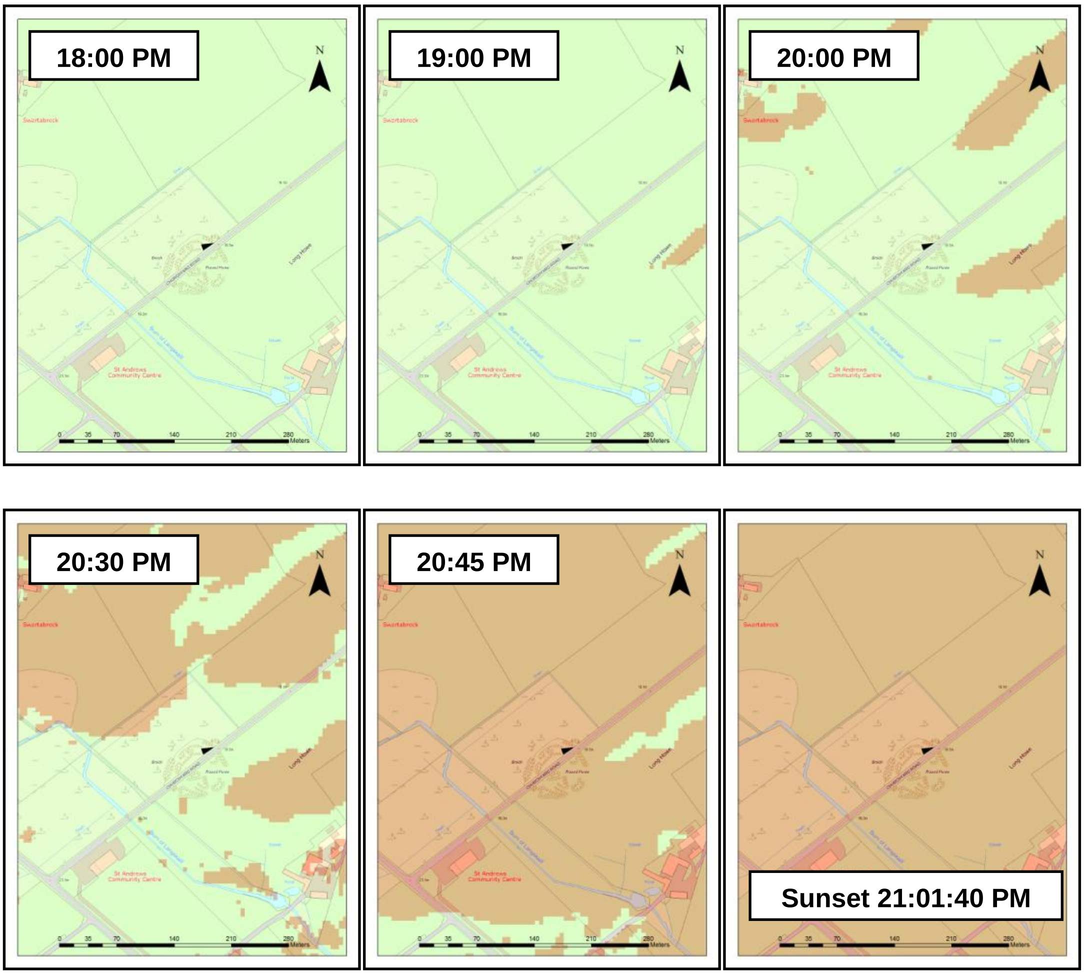


Figure 5.258. 09:00 AM to 17:00 PM around Howe of Langskaill on the Summer Solstice (21st June). Red areas denote areas of shadow.

Figure 5.259. 18:00 PM to Sunset (21:01:40 PM) around Howe of Langskaill on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 2: East Broch of Burray

Canmore ID: 9569

Entrance: E

The Broch and its Landscape Context

This broch (Figures 5.260, 5.261 and 5.262), which has extensive views of Scapa Flow (Figure 263), Hoy and the southern Mainland, was excavated in 1852-3 (Petrie 1859: 56; 1873; J Farrer 1859; see also: Curle 1932: 394; Lynn and Bell 1984; Moore 2006; 2007), and originally would have commanded the entrance into one of the most accessible seaways into Scapa Flow, on the north coast of Burray. It also has views towards three other coast brochs – Loch of Ayre, West Broch of Burray and the Hillock of Breckna.

The Winter Solstice – Figures 5.264 and 5.265

Due to its position in the landscape, the eastern side of the broch quickly gains light only five minutes after sunrise; its entrance being lit. However, though retaining light for the day, the site loses light at between 14:15 and 14:30 PM, around twenty minutes before sunset. An eastern entrance is thus suitable.

The Equinox (21st March) – Figures 5.266 and 5.267

The site and its entrance receive direct about five to ten minutes after sunrise, retaining it until at least 17:45, about ten to fifteen minutes before sunset. For this time of year, an entrance east or west would thus have been beneficial.

The Summer Solstice (21st June) Figures 5.268, 5.269 and 5.270

The broch would have gained direct light within fifteen to twenty minutes after sunrise, and its entrance would have gained light later in the morning. Again, the site and landscape around it retain light for the day, only losing it around fifteen to twenty minutes before sunset.

Conclusions

Its eastern orientation would have received direct sunlight for almost all the year, and in the winter would have been slightly more suitable than a western entrance.

Figure 5.260. East Broch of Burray. View facing Eastwards.
Author’s Photo.

Figure 5.261. East Broch of Burray.
Author’s Photo.

Figure 5.262. Ground Plan of East Broch of Burray.
(After: Petrie 1873: 73; Fig. 1).

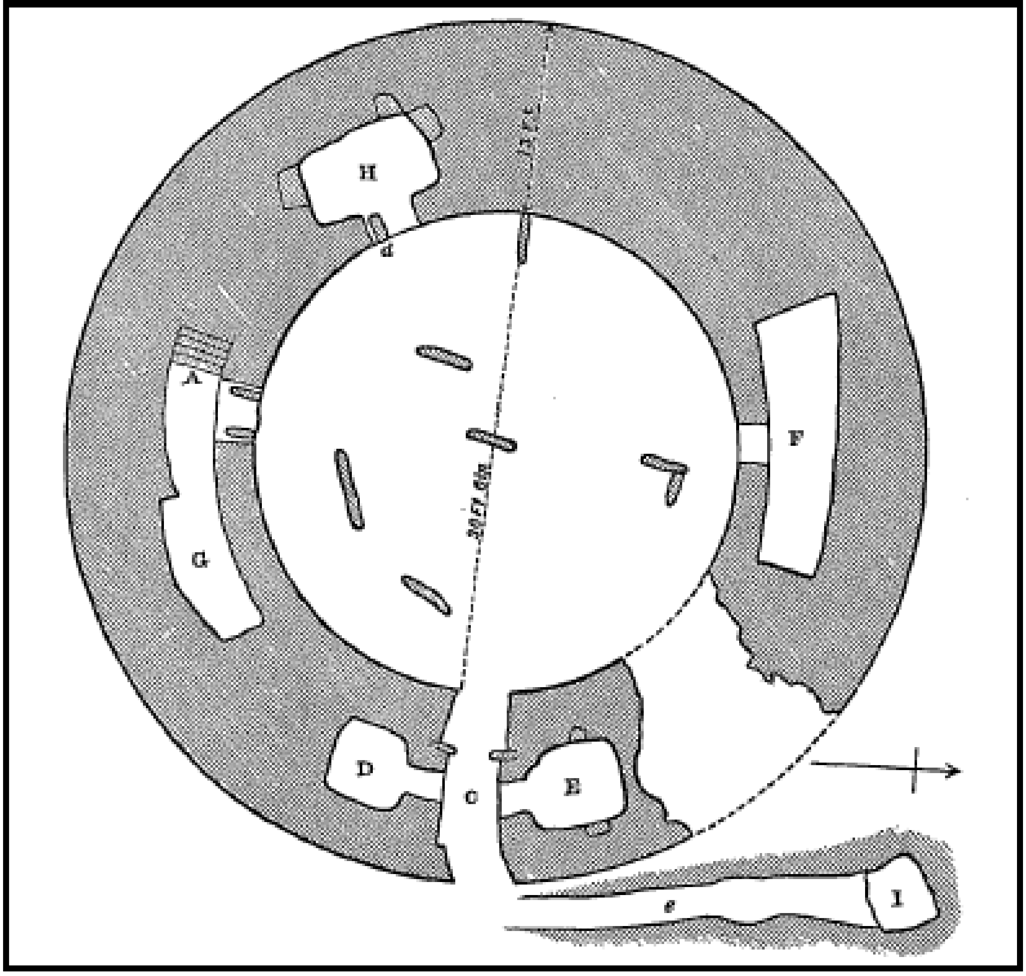
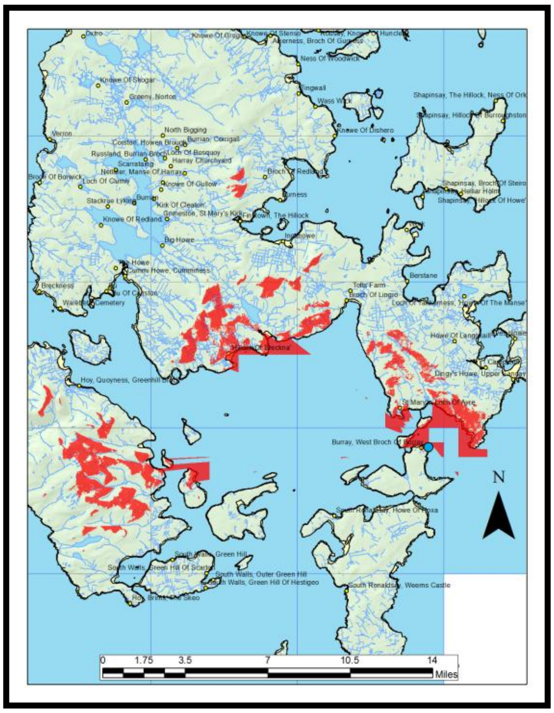


Figure 5.263. Multiple Viewsheds of the East Broch of Burray.



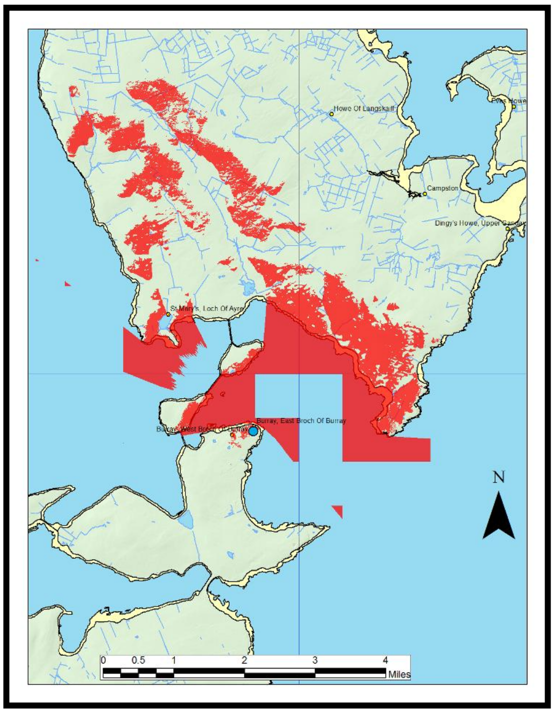


Figure 5.264. Sunrise (08:44 AM) to 13:00 PM around East Broch of Burray on the Winter Solstice (21st December). Red areas denote areas of

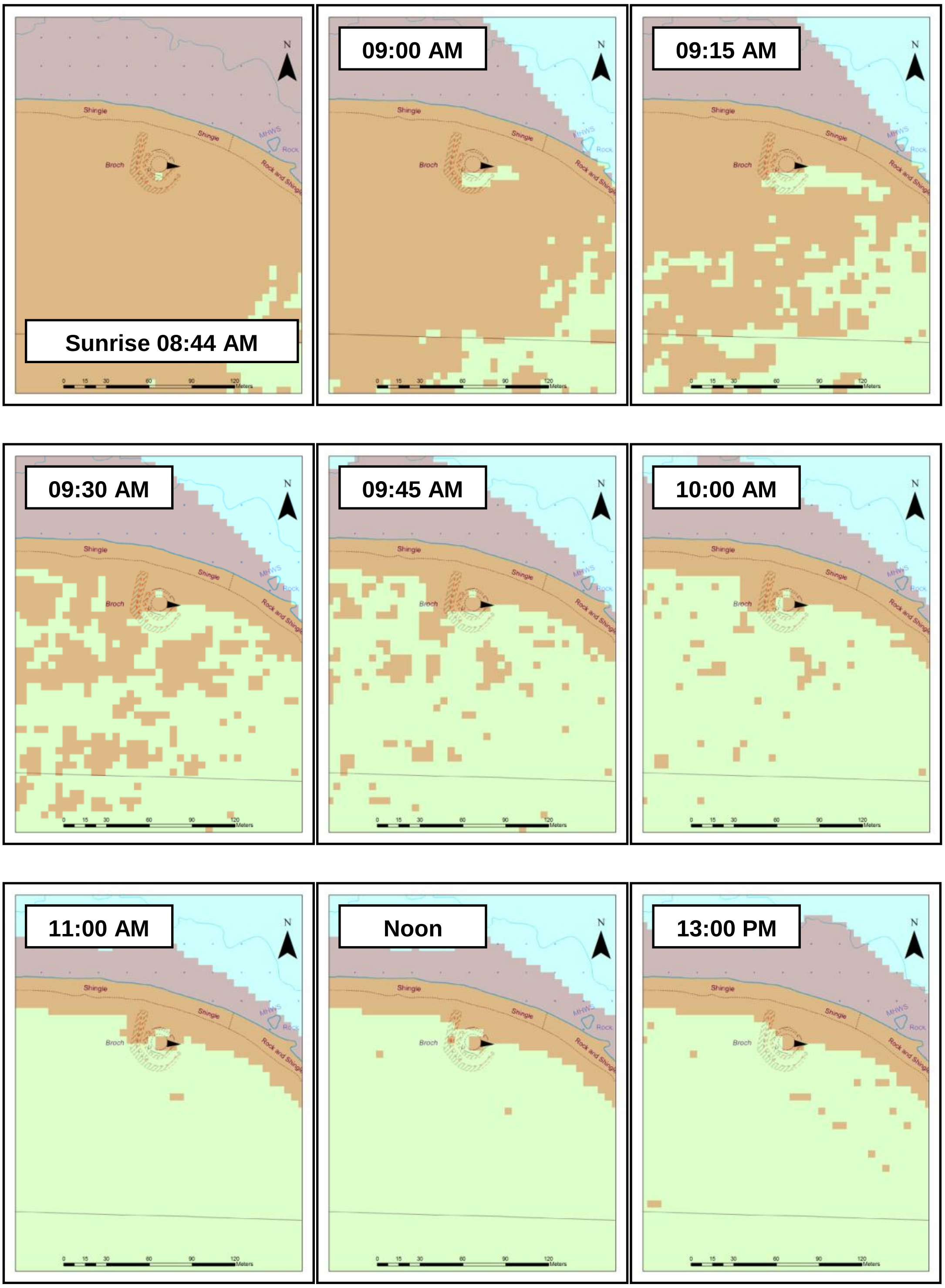


Figure 5.265. 13:30 PM to Sunset (14:47 PM) around East Broch of Burray on the Winter Solstice (21st December). Red areas denote areas of shadow.

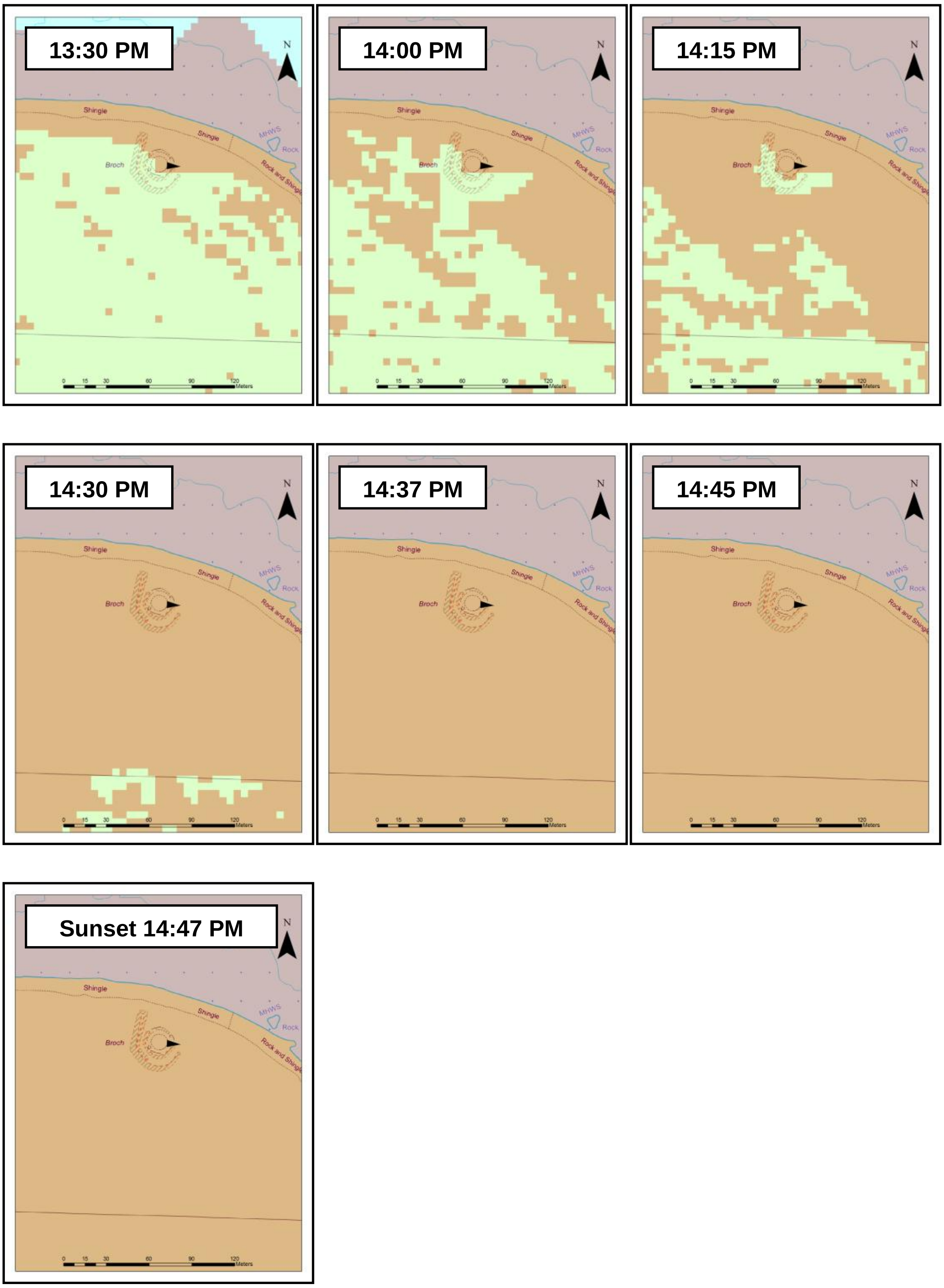


Figure 5.266.Sunrise (05:48 AM) to 11:00 AM around East Broch of Burray on the Spring Equinox (21st March). Red areas denote areas of shadow.

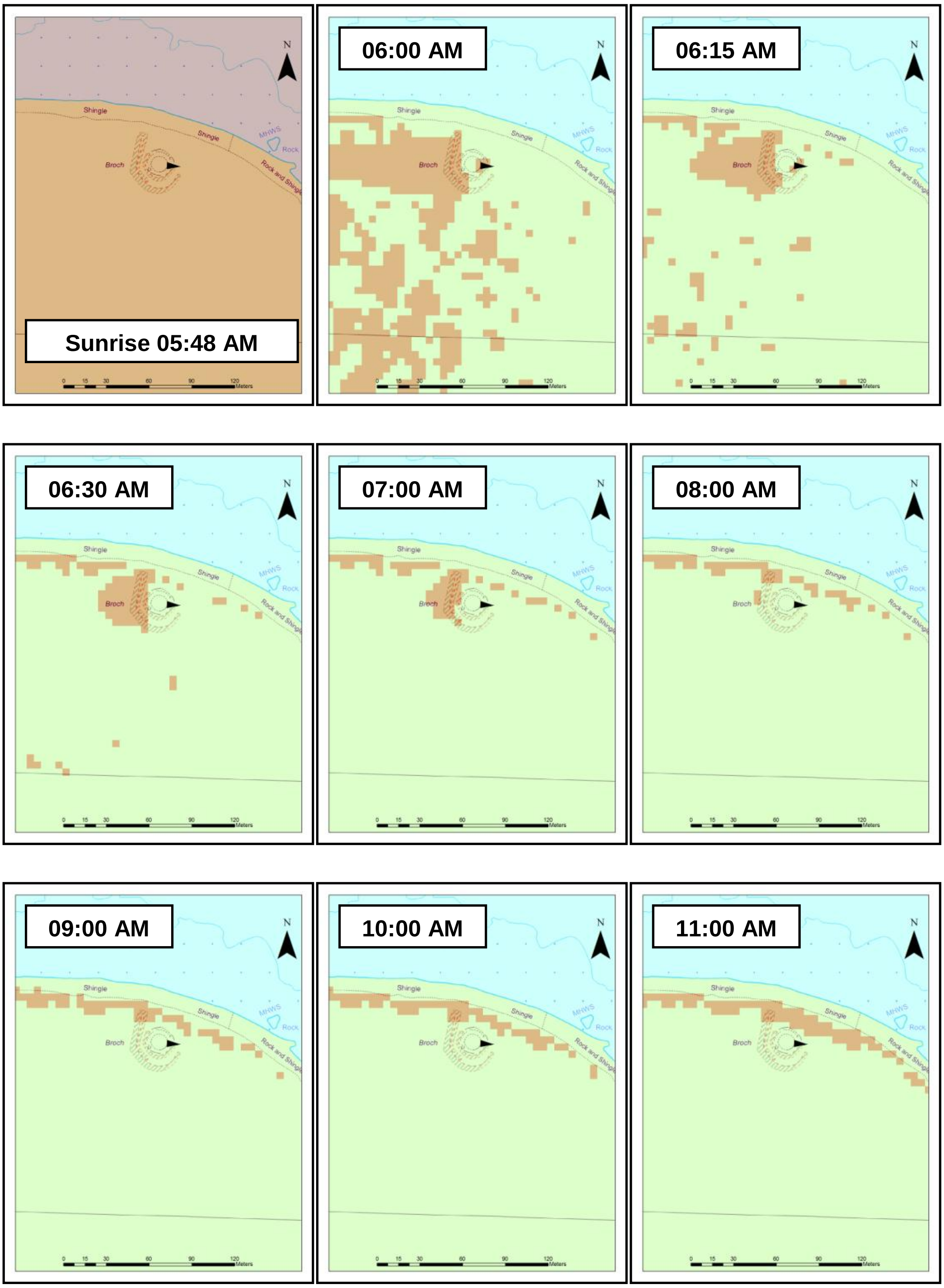


Figure 5.267. Noon to Sunset (18:02:15 PM) around East Broch of Burray on the Spring Equinox (21st March). Red areas denote areas of shadow.

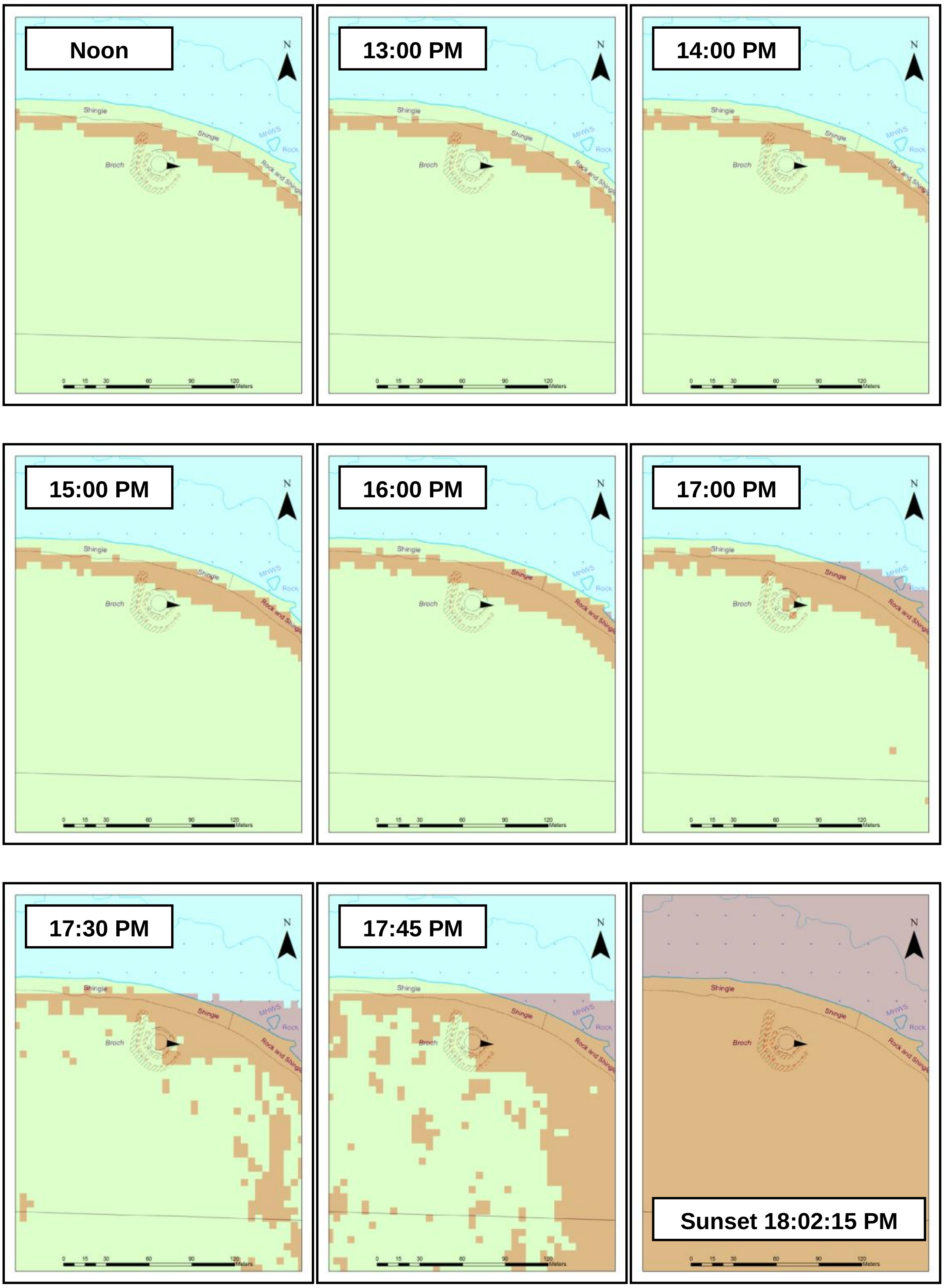


Figure 5.268. Sunrise (02:36:40 AM) to 09:00 AM around East Broch of Burray on the Summer Solstice (21st June). Red areas denote areas of shadow.

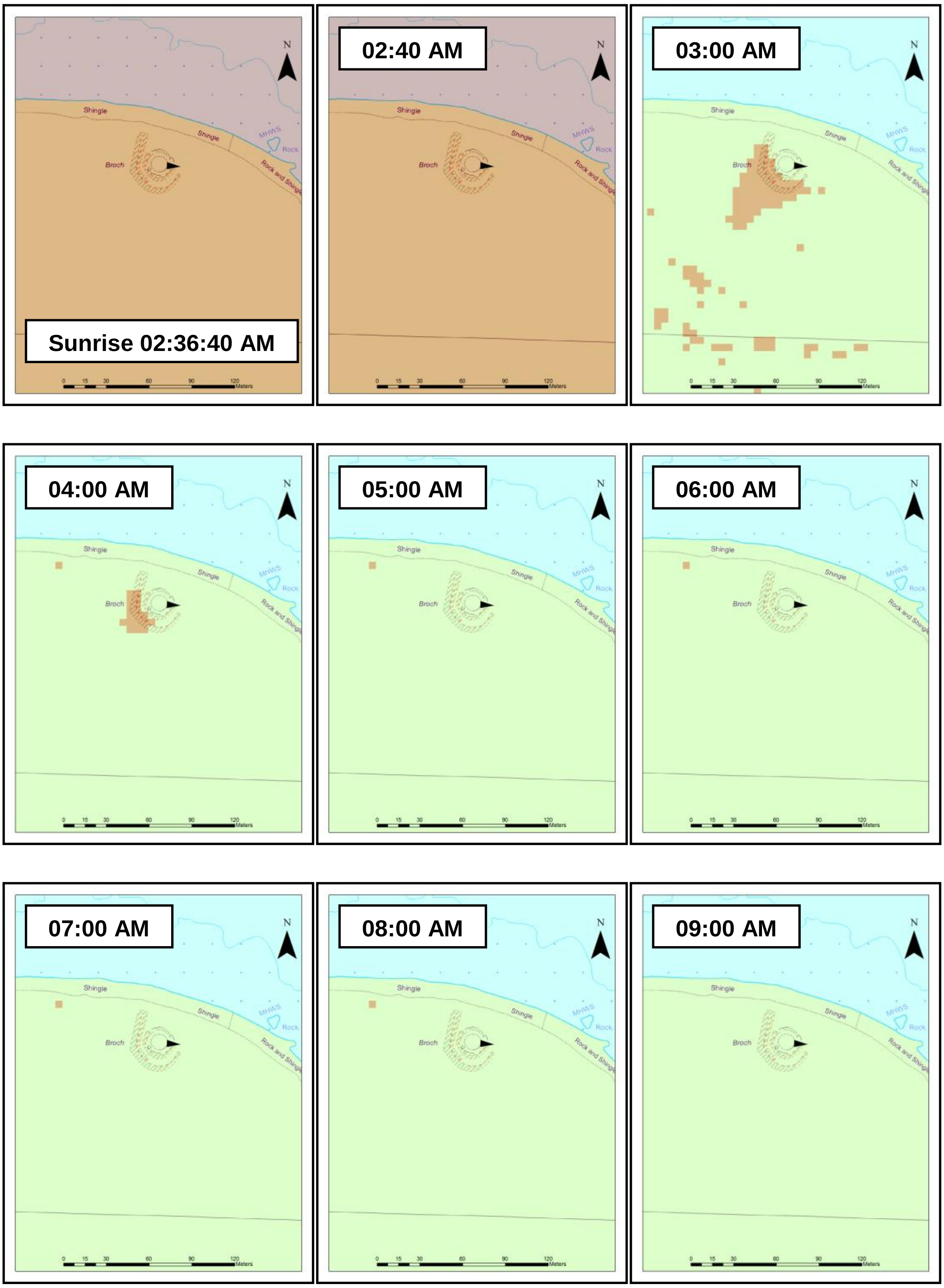


Figure 5.269.10:00 AM to 18:00 PM around East Broch of Burray on the Summer Solstice (21st June). Red areas denote areas of shadow.

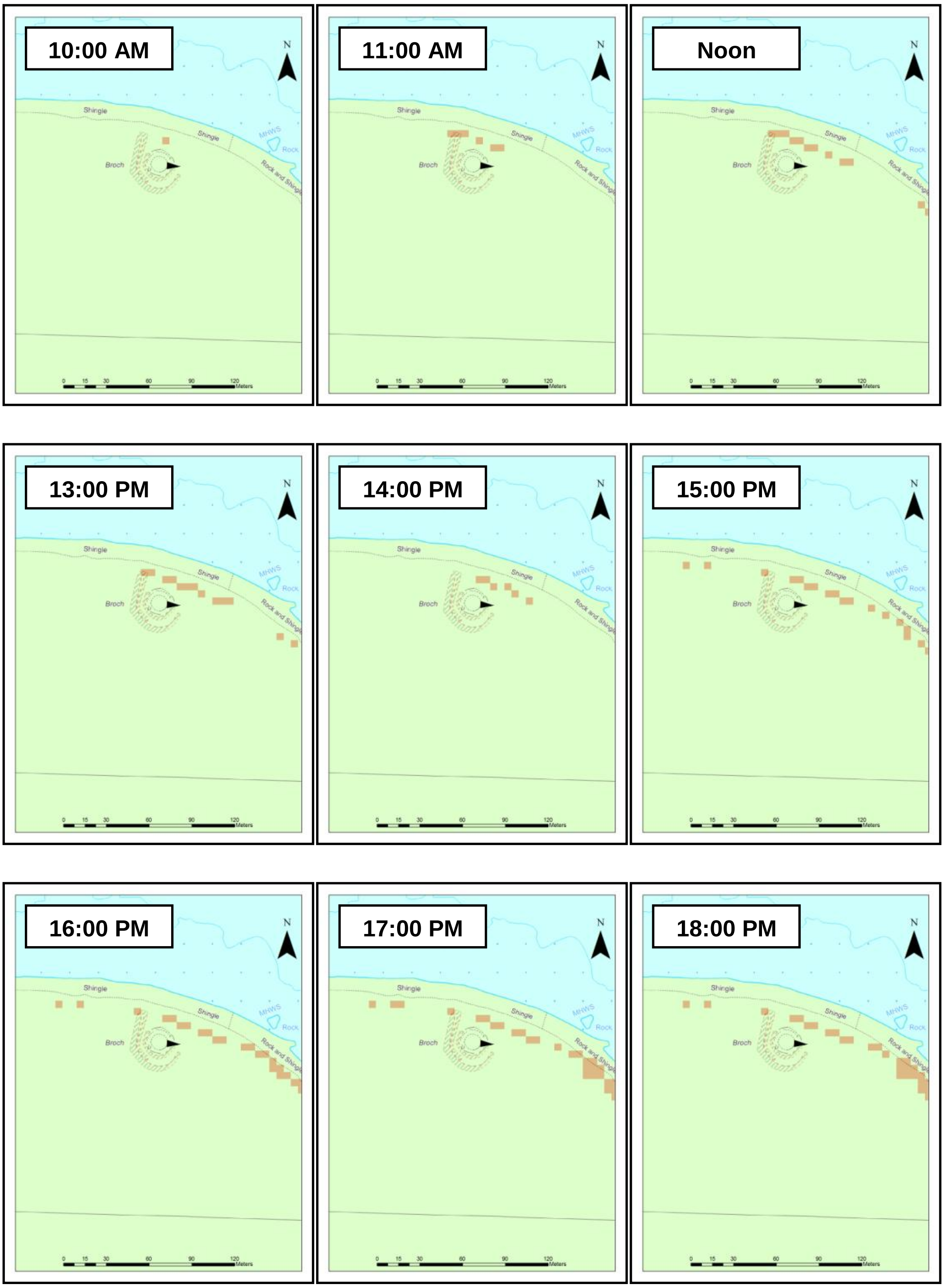
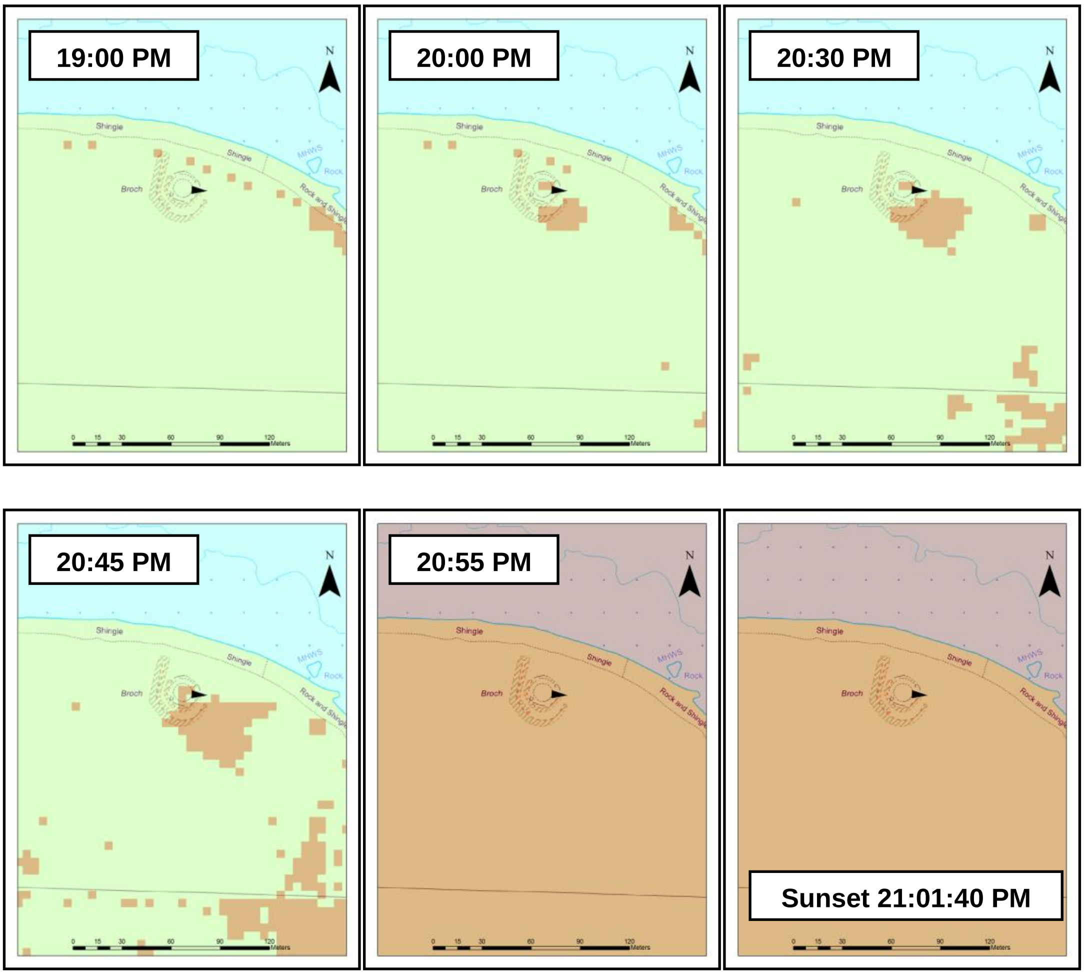


Figure 5.270. 19:00 PM to Sunset (21:01:40 PM) around East Broch of Burray on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 3: Hillock of Burroughston

Canmore ID: 3136

Entrance: E

The Broch and its Landscape Context

This Shapinsay broch (Figure 5.271), excavated by Petrie in 1862 (Petrie 1873: 81-84; RCAHMS 1946: 275; see also: Card 2007), lies below gently sloping land, above a low rocky beach. Being so close to the shore here, it commands this area of the seaway and obviously has extensive views of the sea (Figure 5.272), overlooking the eastern approach of Orkney, with good views towards Sanday, Egilsay and Stronsay, and possessing views of very few other brochs.

The Winter Solstice – Figures 5.273 and 5.274

This broch gains light at sunrise, and within minutes the surrounding landscape is in direct sunlight. The site loses light quite early, at around 14:15 PM, losing it completely between then and 14:30 PM, probably around half an hour before sunset. For the winter then, its eastern entrance was suitable.

The Equinox (21st March) – Figures 5.275 and 5.276

Within ten minutes of sunrise, the landscape and broch is in direct sunlight, retaining it for the entire day, until around 17:45 PM, about fifteen minutes before sunset. Again, the eastern entrance was most suitable for this time of year.

The Summer Solstice (21st June) Figures 5.277, 5.278 and 5.279

The site and its surroundings gain direct sunlight at sunrise, retaining it until probably just before 20:30 PM, about half an hour before sunset, losing it completely by 20:45 PM.

Conclusions

Like other sites in Orkney, this broch retains direct light for much of the day for all of the year. Its eastern entrance was probably the most efficient and would have allowed more direct light than a western entrance.

Figure 5.271. Ground Plan of Hillock of Burroughston.
(After: Petrie 1873: 83; Fig. 10).

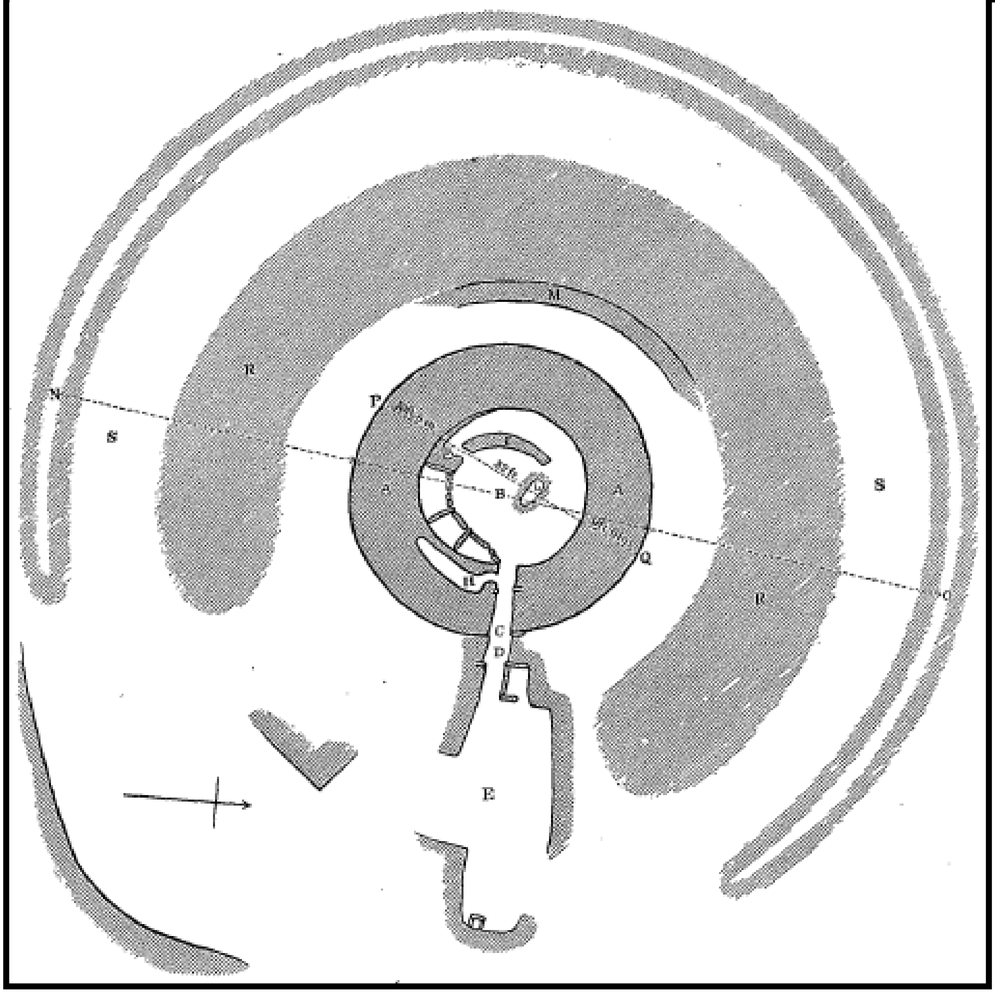
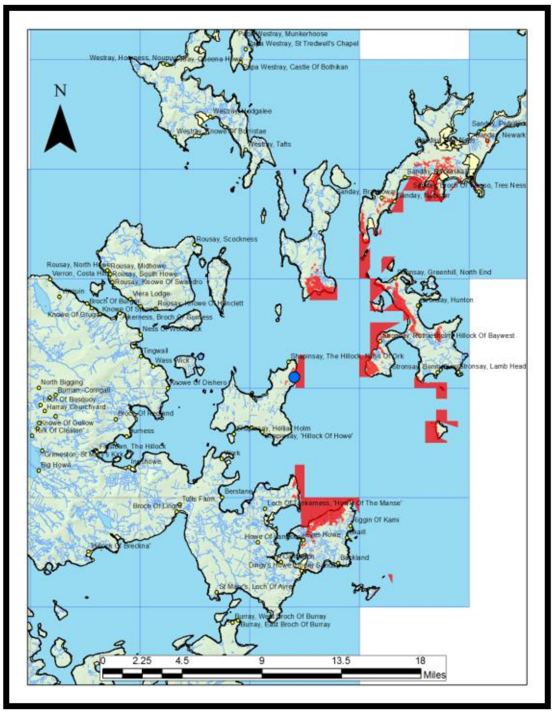


Figure 5.272. Multiple Viewsheds of the Hillock of Burroughston.



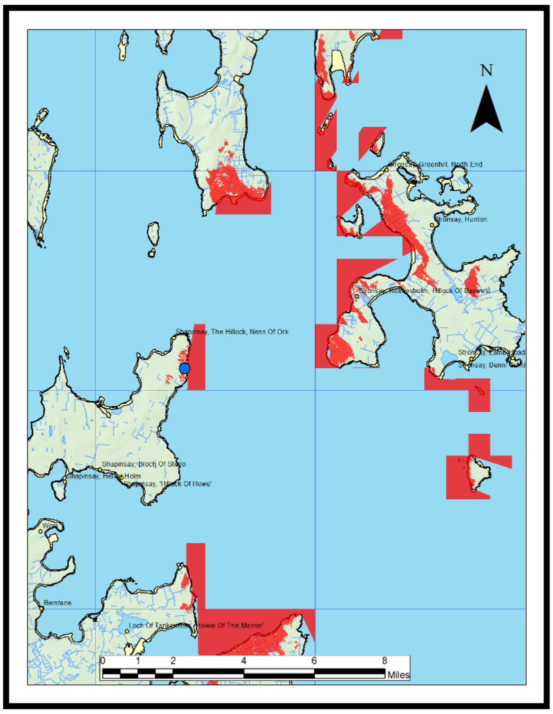


Figure 5.273. Sunrise (08:44 AM) to 13:00 PM around Hillock of Burroughston on the Winter Solstice (21st December). Red areas denote areas of shadow.

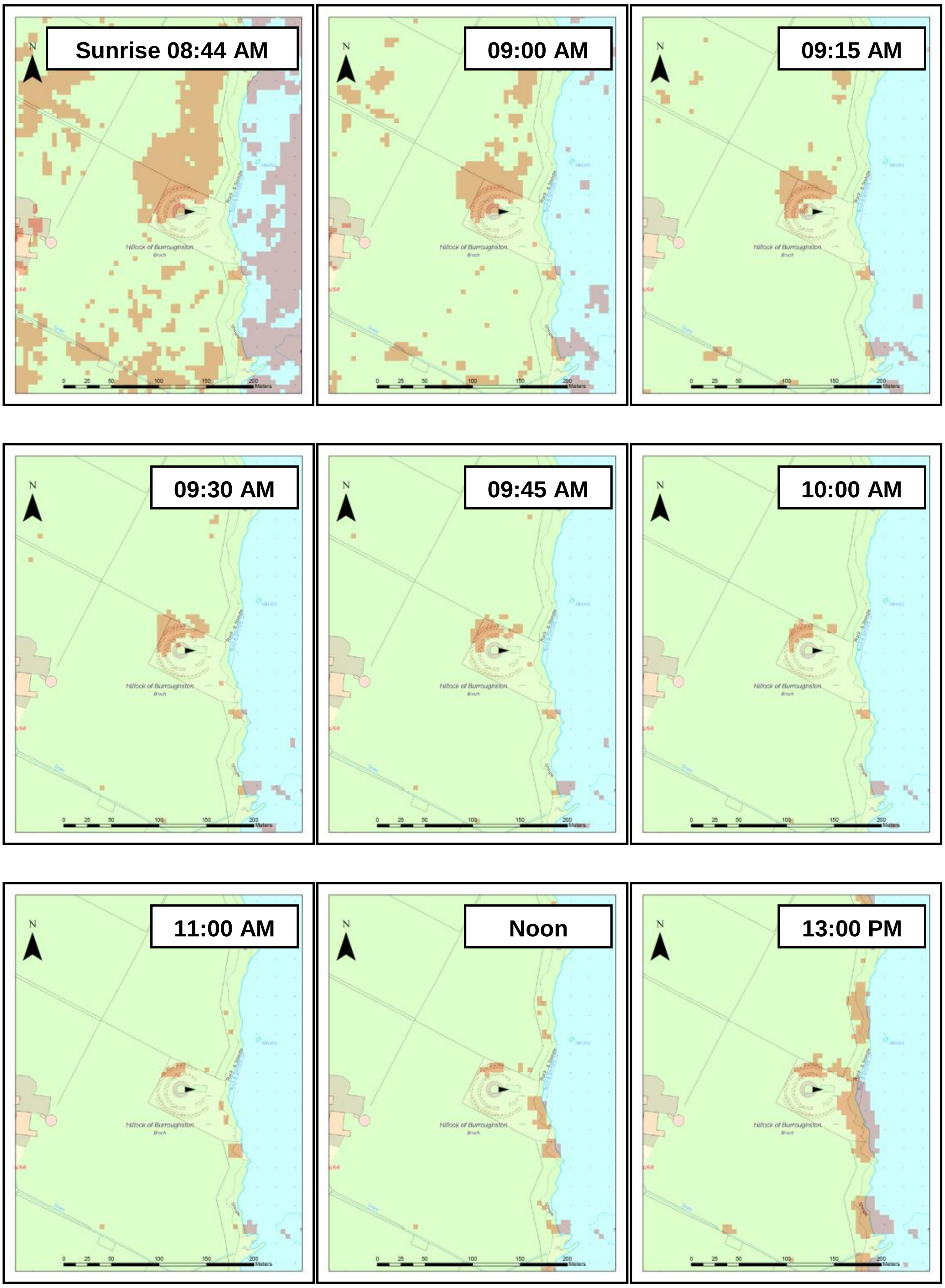


Figure 5.274. 13:30 PM to Sunset (14:47 PM) around Hillock of Burroughston on the Winter Solstice (21st December). Red areas denote areas of shadow.

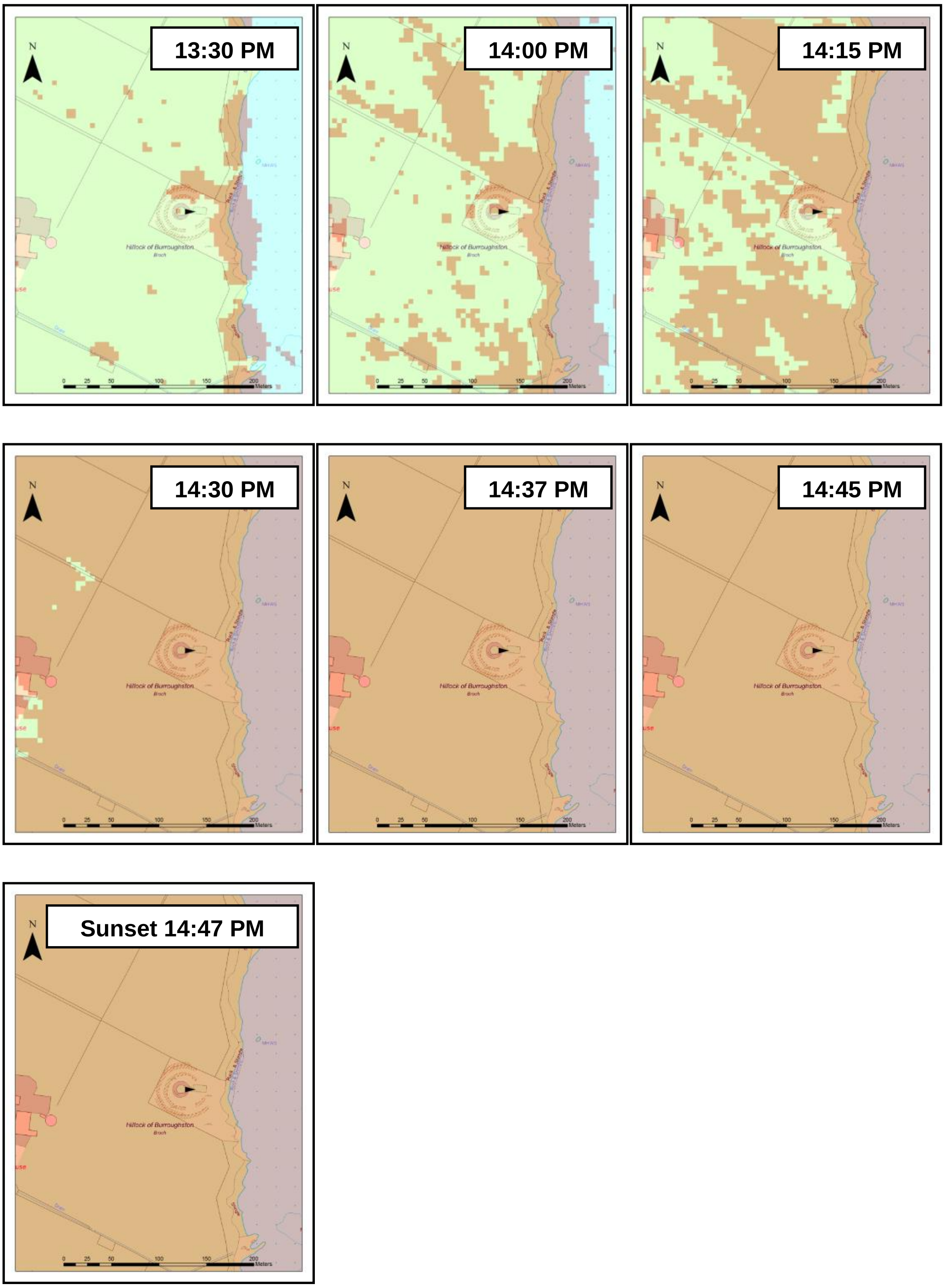


Figure 5.275. Sunrise (05:48 AM) to 11:00 AM around Hillock of Burroughston on the Spring Equinox (21st March). Red areas denote areas of shadow.

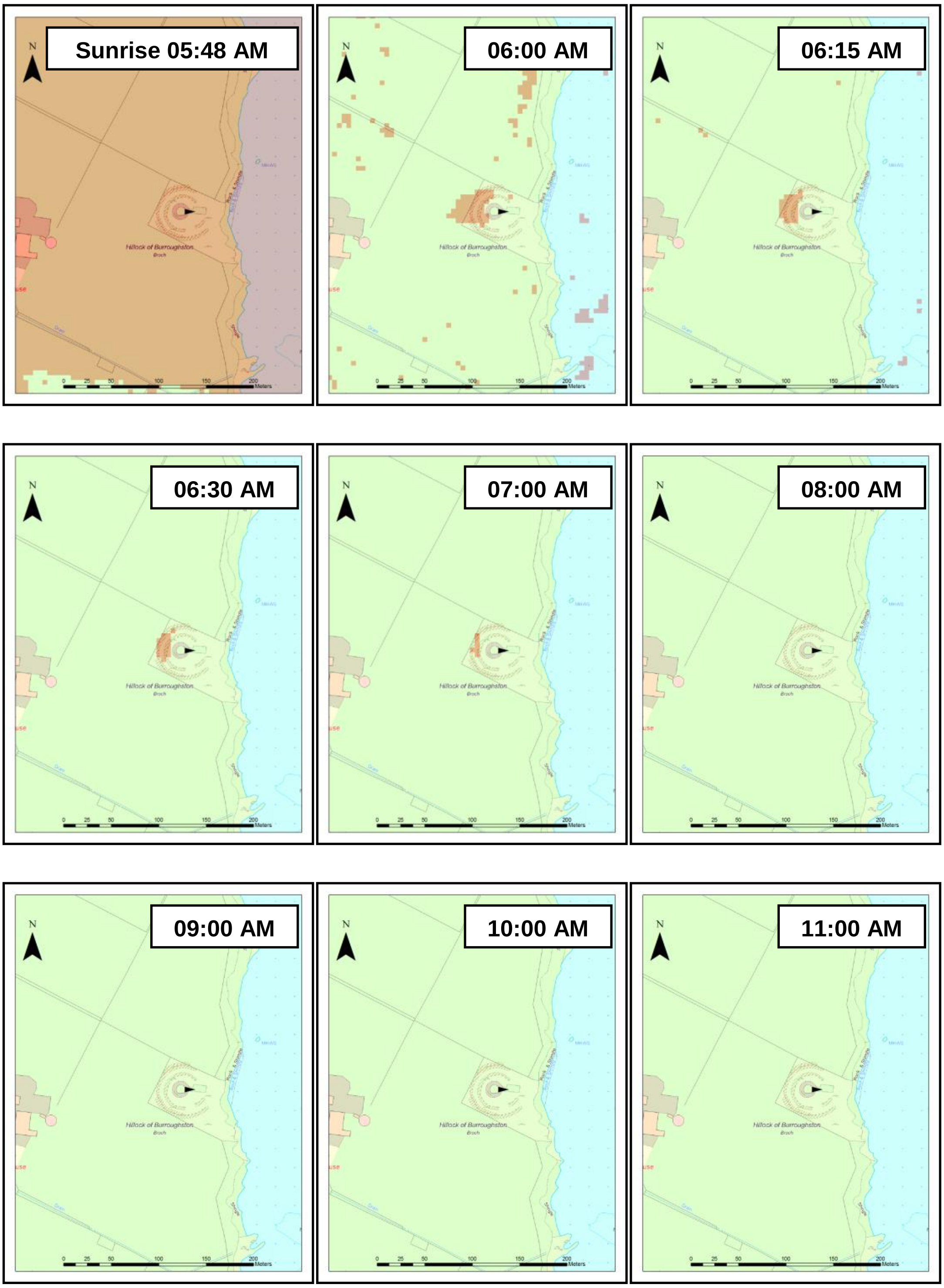


Figure 5.276. Noon to Sunset (18:02:15 PM) around Hillock of Burroughston on the Spring Equinox (21st March). Red areas denote areas of shadow.

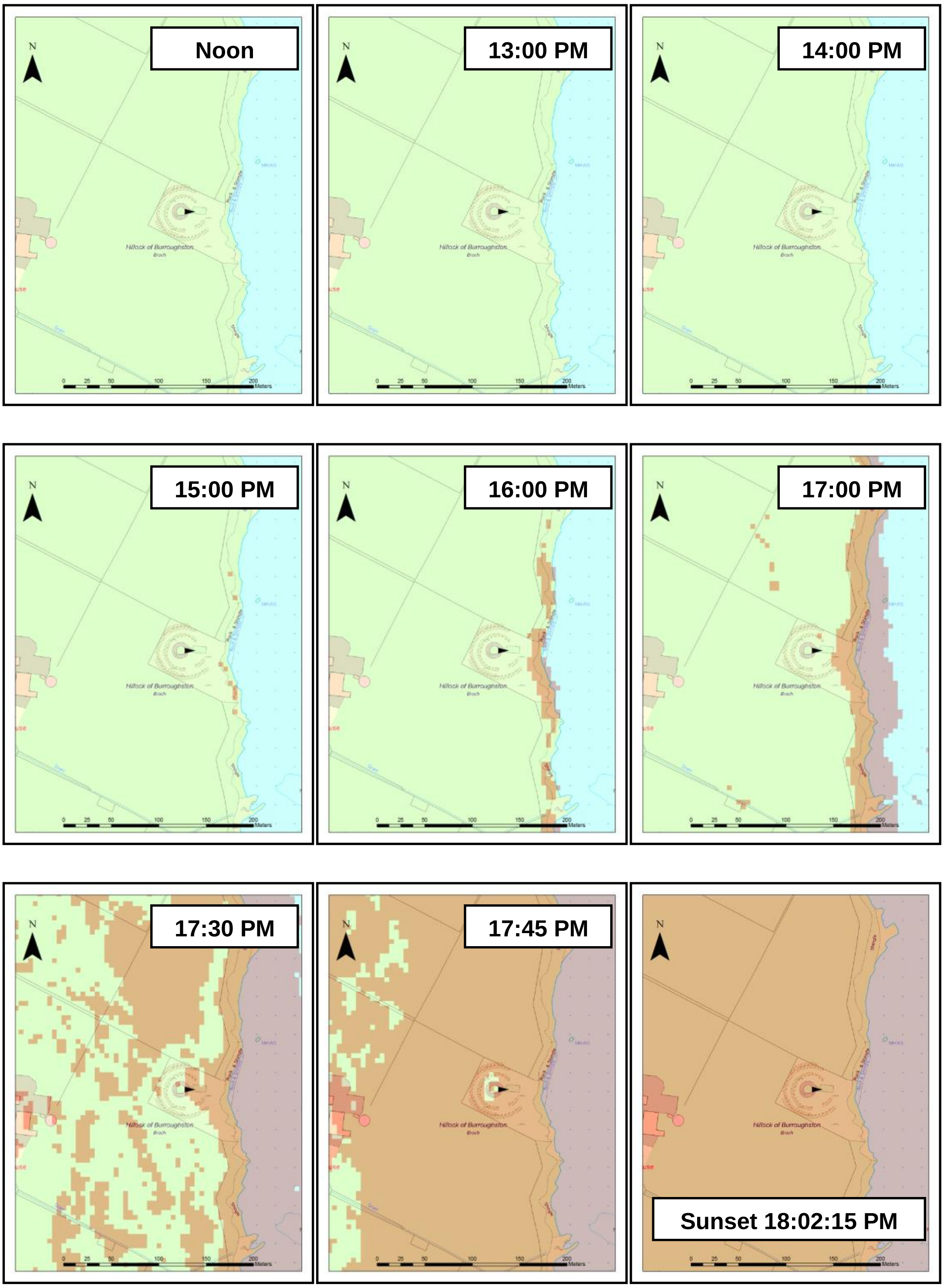


Figure 5.277. Sunrise (02:36:40 AM) to 08:00 AM around Hillock of Burroughston on the Summer Solstice (21st June). Red areas denote areas of shadow.

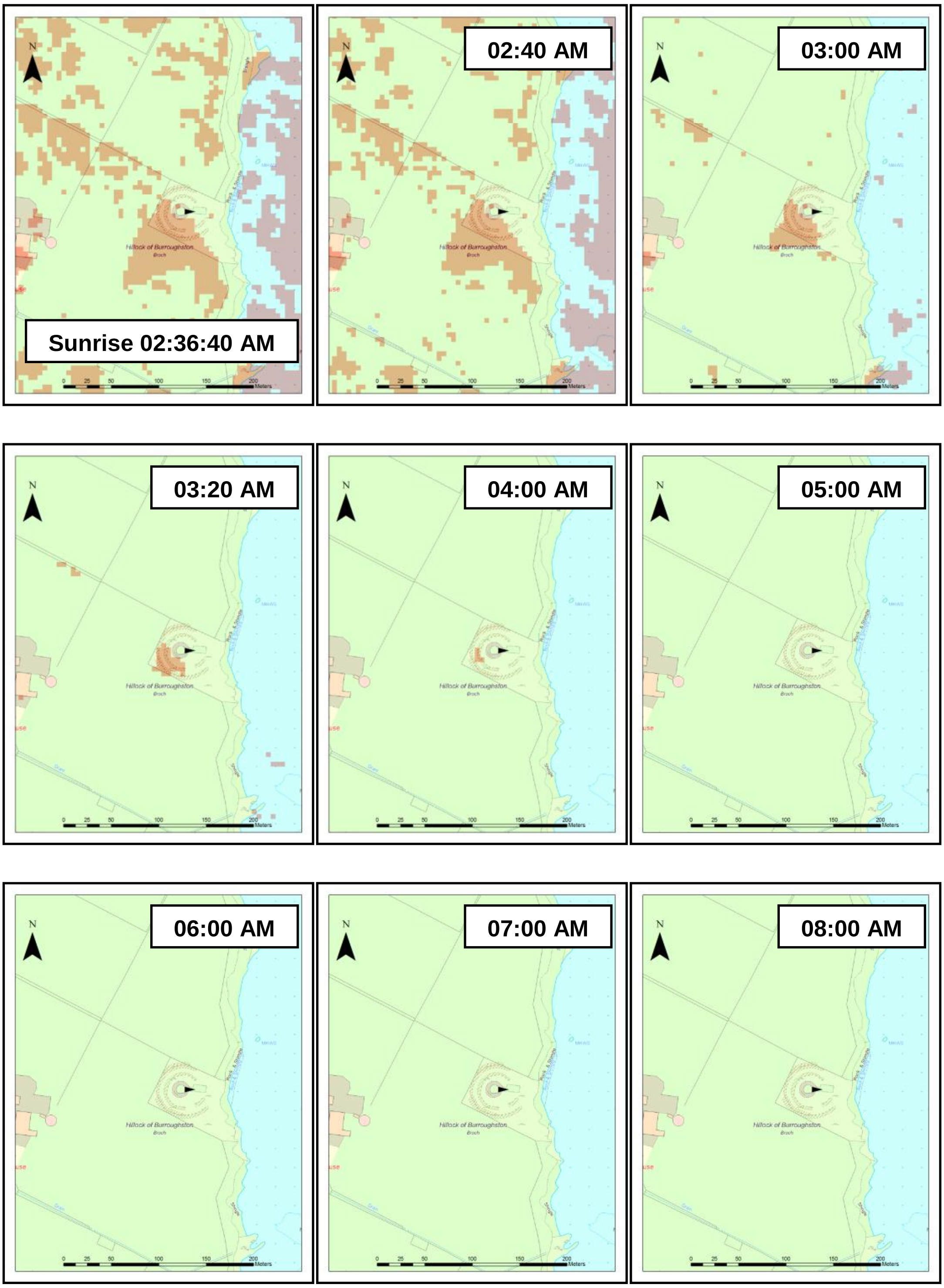


Figure 5.278. 09:00 AM to 17:00 PM around Hillock of Burroughston on the Summer Solstice (21st June). Red areas denote areas of shadow.

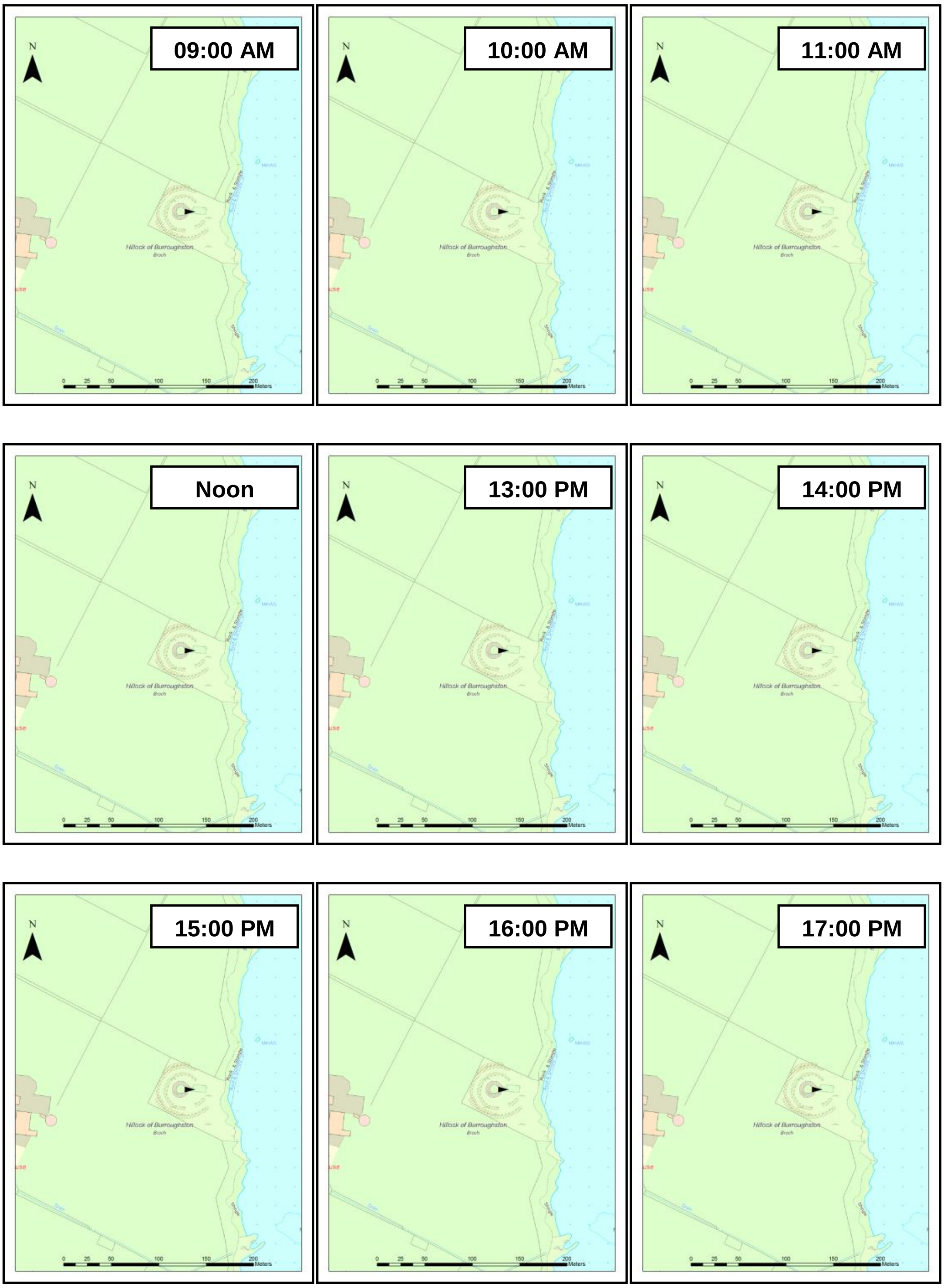
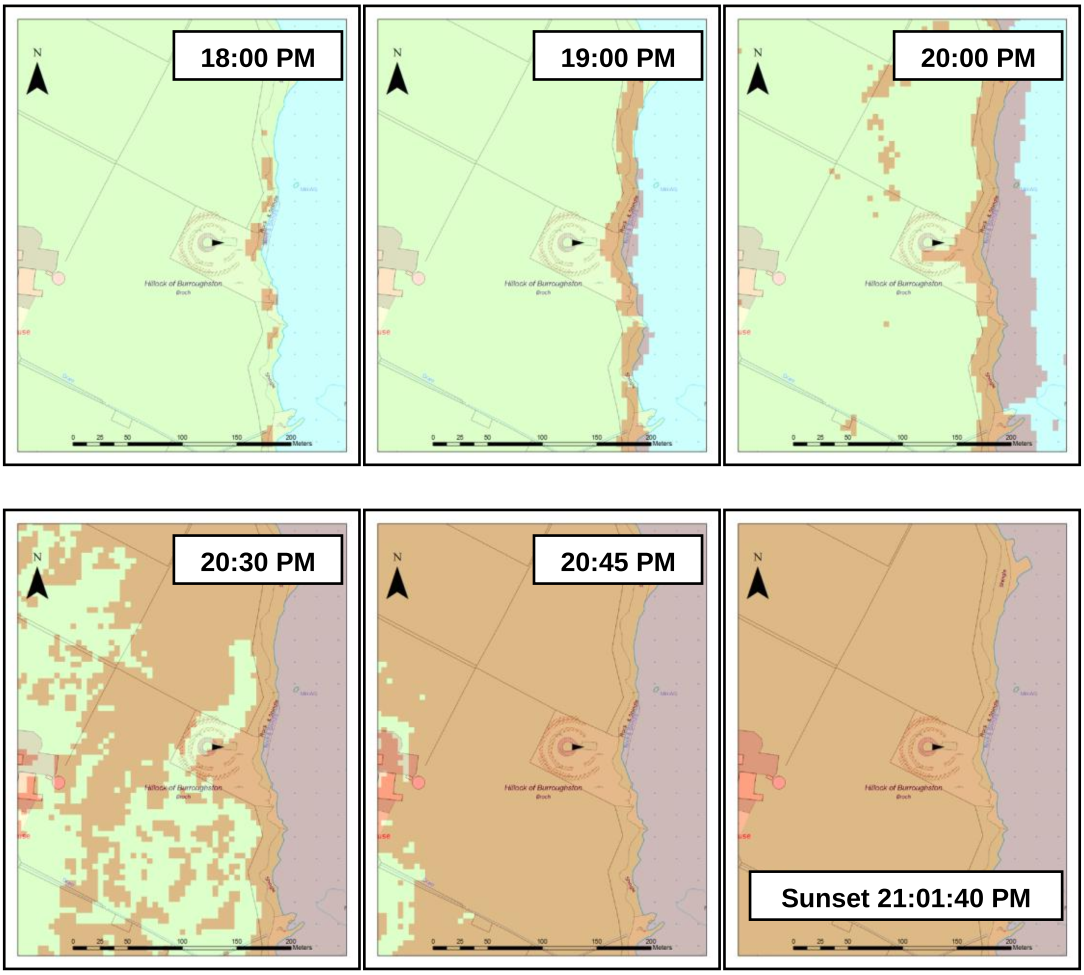


Figure 5.279. 18:00 PM to Sunset (21:01:40 PM) around Hillock of Burroughston on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 4: Broch of Gurness

Canmore ID: 2201

Entrance: E

The Broch and its Landscape Context

The broch of Gurness (Figures 5.280, 5.281, 5.282, 5.283 and 5.284), and its associated village, stands on the tip of a promontory on the north-eastern coast of Mainland, and with an abundant amount of research having been carried out upon this site, it is regarded as one of the better understood brochs in Orkney (see: Fojut 1993; Foster 1989a; Hedges 1987c; Hollinrake 2009; MacKie 1994; Ovenden 2007; Richardson 1948). However, coastal erosion has removed the northernmost section of the earth works of Gurness and part of the broch village structure which surrounds the main tower. As it is located on a promontory which projects out into Eynhallow Sound, one of the most dangerous stretches of water in Orkney, Gurness has excellent views down north-eastern side of Mainland (Figure 5.285), possessing good views of the northern entrance into the sound, as well as brochs located on the northern Mainland such as the Broch of Burgar, Vinquin, Costa Hill, and the Knowe of Stenso. Views of southern Rousay are also excellent, visible to all the brochs located here.

The Winter Solstice – Figures 5.286 and 5.287

The broch only gains direct light nearly an hour after sunrise, at around 09:45 AM, and so the entrance would have gained direct little light in the morning. The broch and its landscape then retain light until around 14:00 PM, when shadow encroaches upon the broch, about fifty minutes before sunset. For the winter then, a south-westerly entrance would have probably benefited most.

The Equinox (21st March) – Figures 5.288 and 5.289

Gurness gains direct sunlight within ten minutes after sunrise, retaining it for the day, probably until the last ten minutes before sunrise. Therefore, a westerly or easterly entrance would have benefited regardless, suggesting it was the morning light which was favoured.

The Summer Solstice (21st June) Figures 5.290, 5.291 and 5.292

Gurness gains light between twenty-five to forty minutes after sunrise. The broch then retains light until just before sunset, probably about five minutes before sun set, though some of its landscape retains it until sunset itself. A western entrance would thus have been slightly more suitable.

Conclusions

Throughout much of the year, a westerly entrance would have probably been slightly better than its eastern facing doorway, especially during winter and summer. This suggests that the morning light was more important within the broch, especially during the spring and summer.

Figure 5.280. View from eastern entrance of Gurness.
Author's Photo.

Figure 5.281. Westwards wiew over Eynhallow Sound from Gurness.

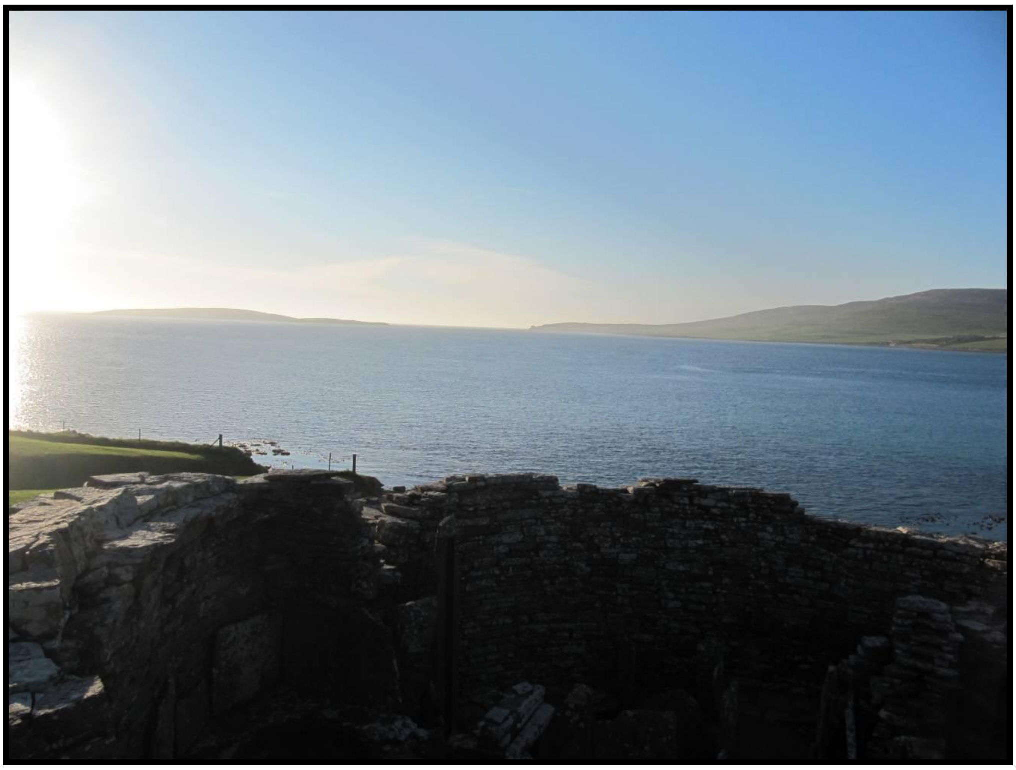


Figure 5.282. Southwards view from Gurness.
Author’s Photo.

Figure 5.283. Gurness Broch, from the west.
Author’s Photo.

Figure 5.284. Ground Plan of Gurness.
(After: Bell and Hedges 1980: 93; Fig. 4).

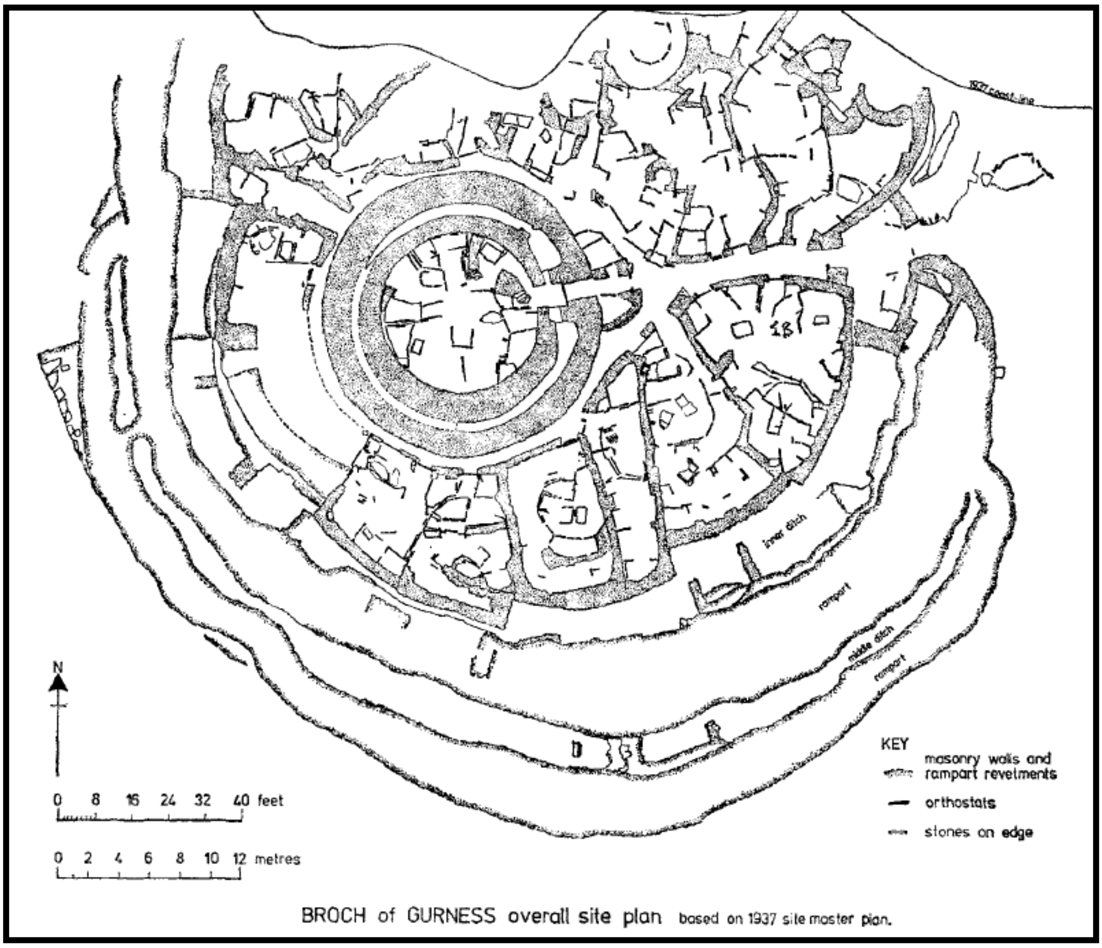


Figure 5.285. Multiple Viewsheds of Gurness Broch

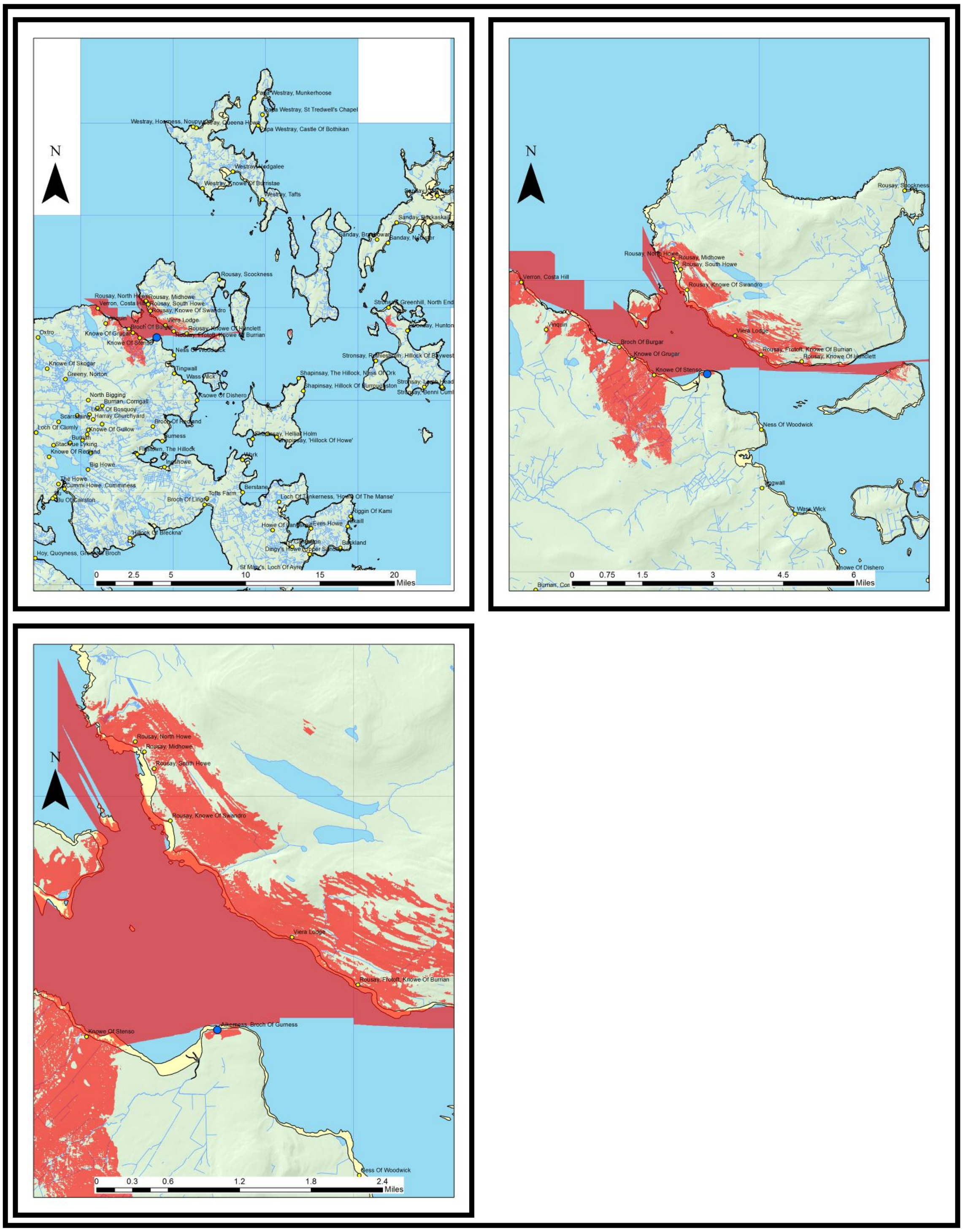


Figure 5.286. Sunrise (08:44 AM) to 13:00 PM around Gurness on the Winter Solstice (21st December). Red areas denote areas of shadow.

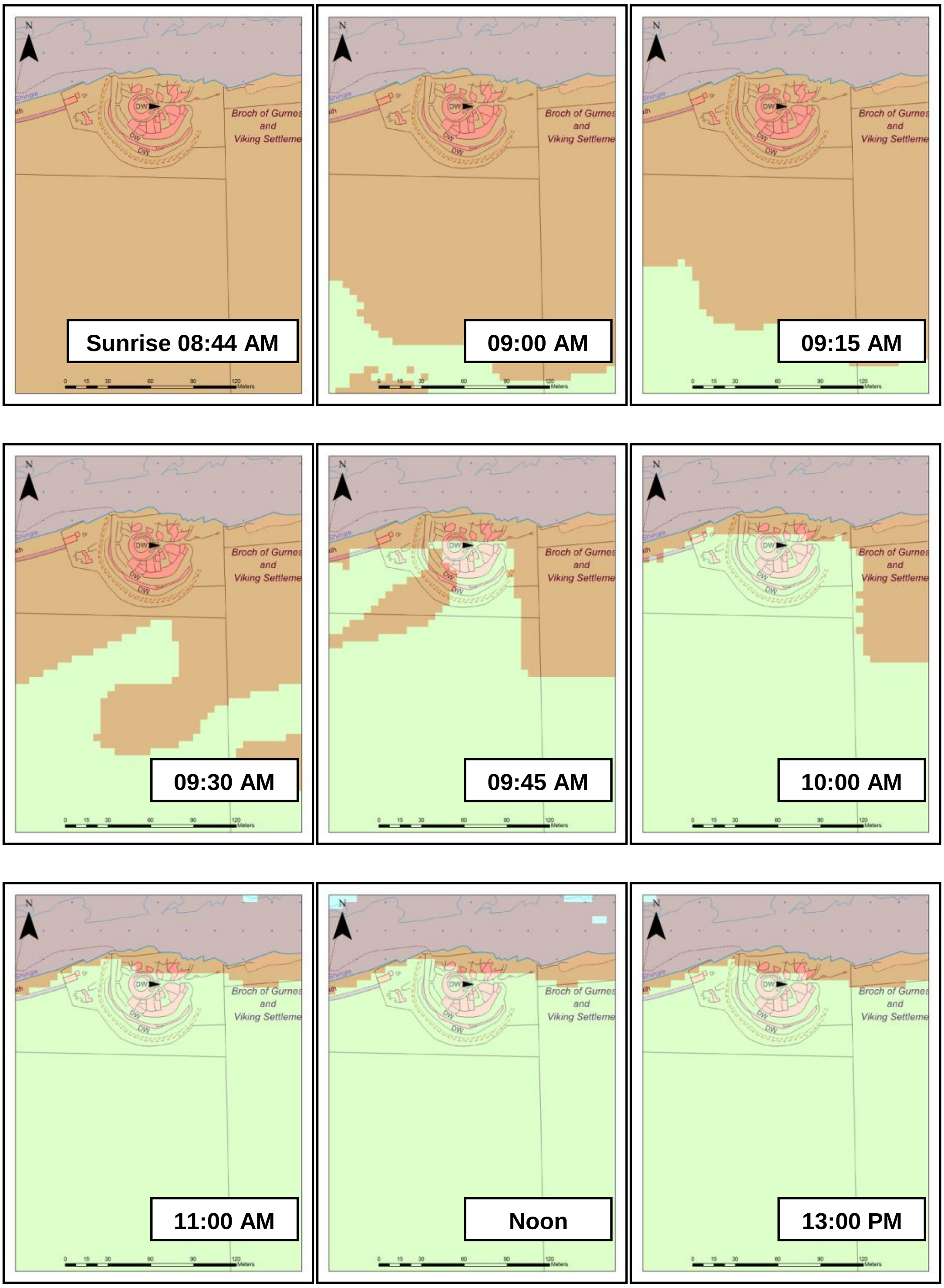


Figure 5.287. 13:30 PM to Sunset (14:47 PM) around Gurness on the Winter Solstice (21st December). Red areas denote areas of shadow.

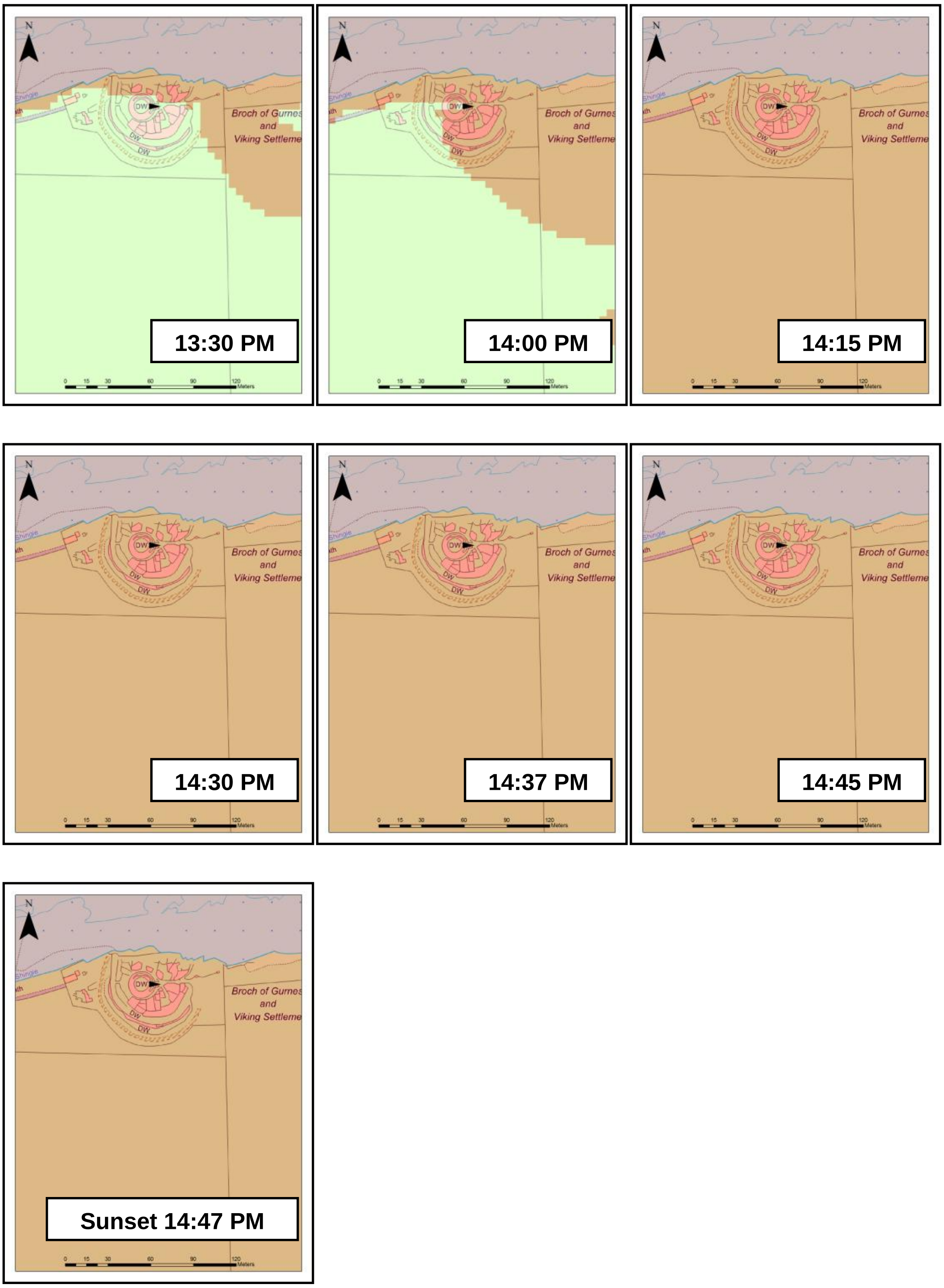


Figure 5.288. Sunrise (05:48 AM) to 11:00 AM around Gurness on the Spring Equinox (21st March). Red areas denote areas of shadow.

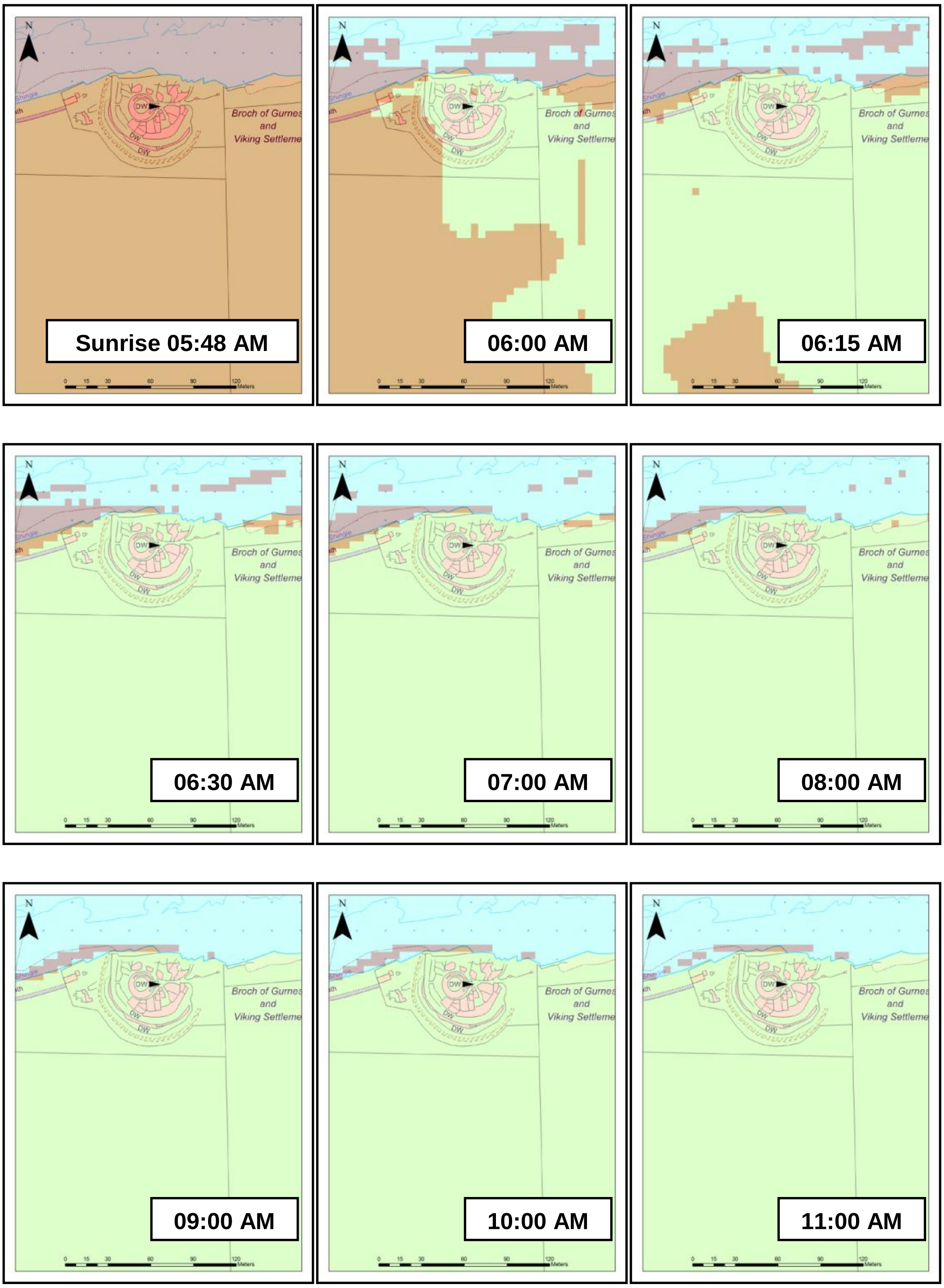


Figure 5.289. Noon to Sunset (18:02:15 PM) around Gurness on the Spring Equinox (21st March). Red areas denote areas of shadow.

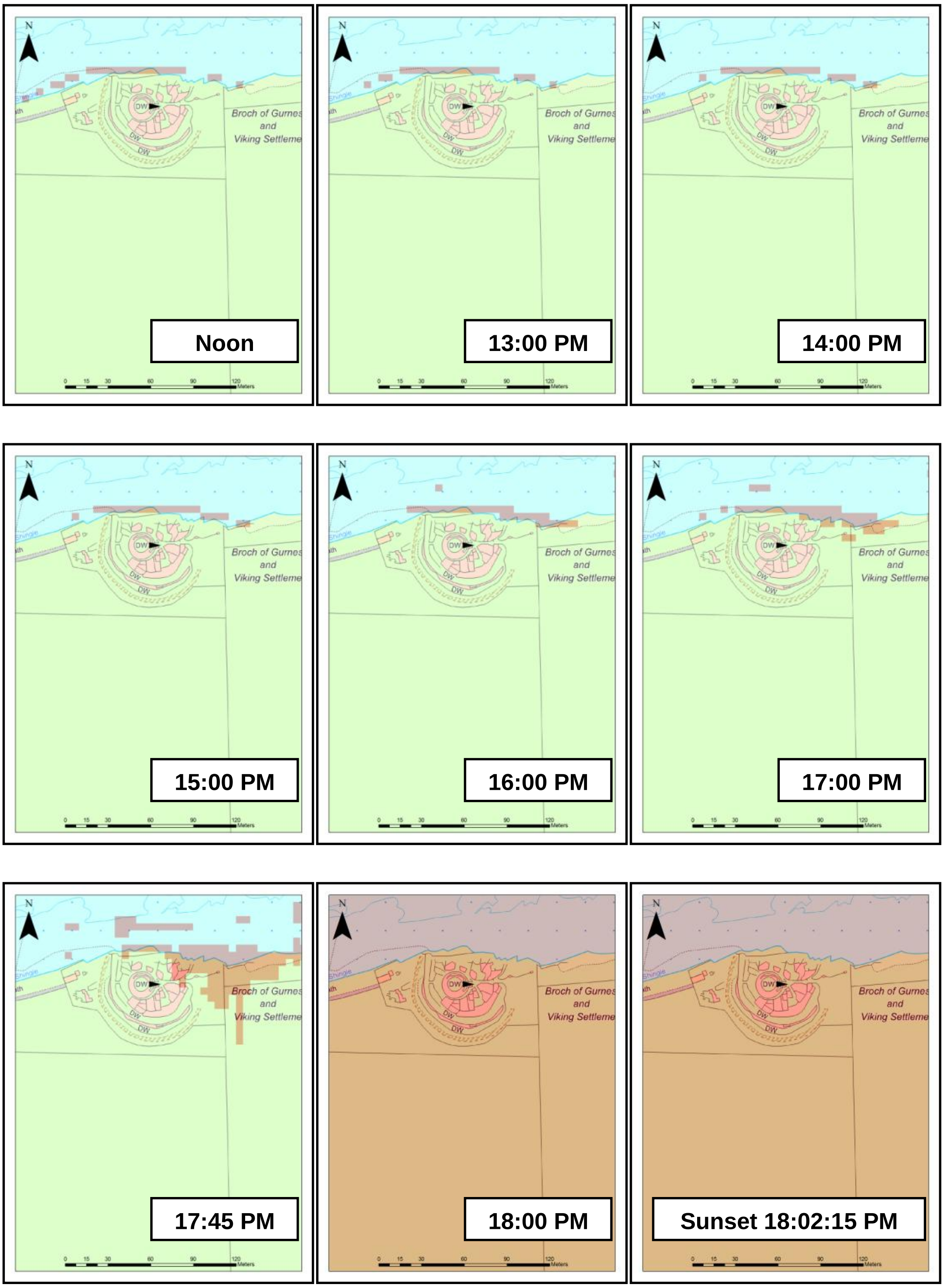


Figure 5.290. Sunrise (02:36:40 AM) to 08:00 AM around Gurness on the Summer Solstice (21st June). Red areas denote areas of shadow.

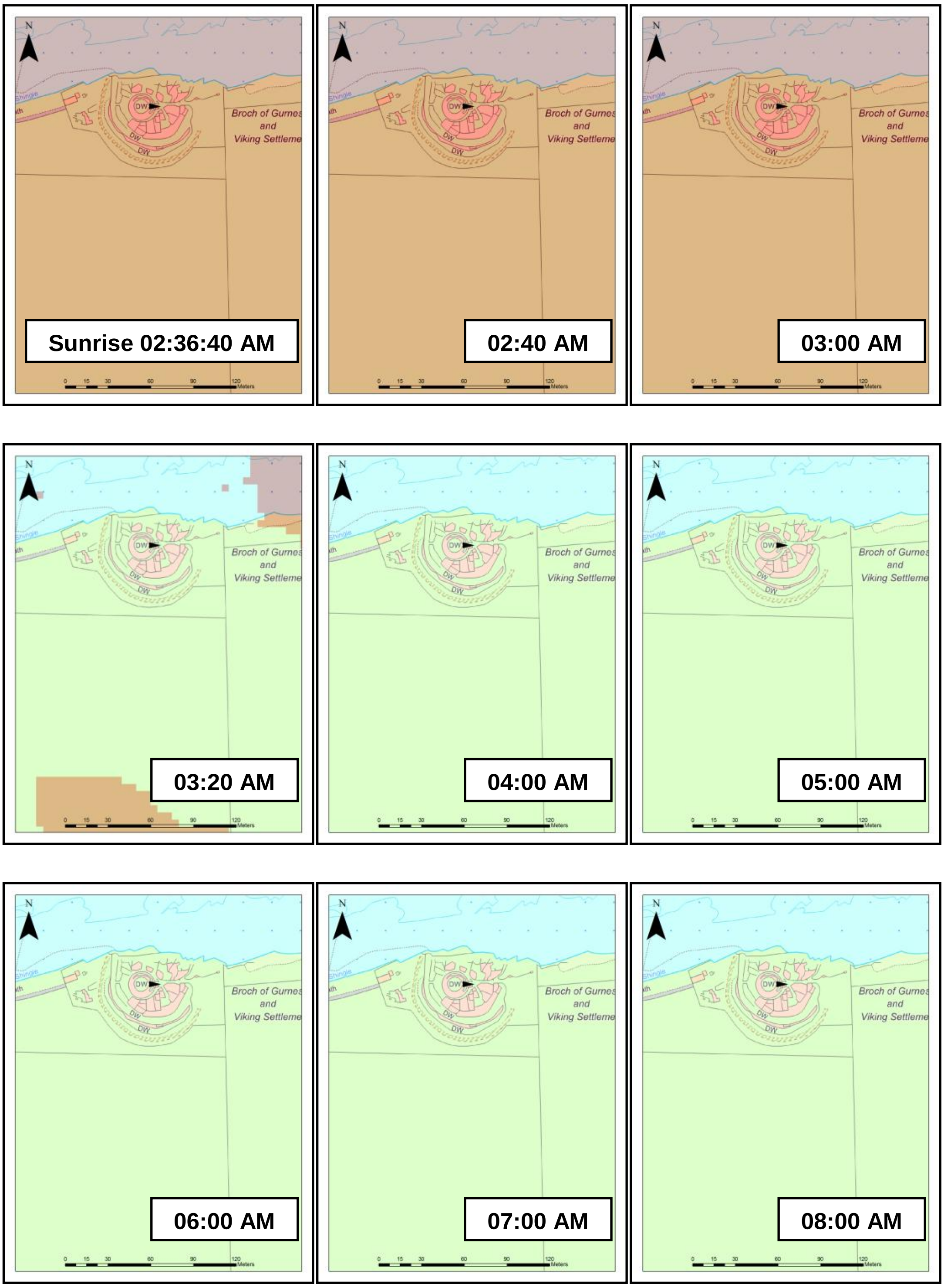


Figure 5.291. 09:00 AM to 17:00 PM around Gurness on the Summer Solstice (21st June). Red areas denote areas of shadow.

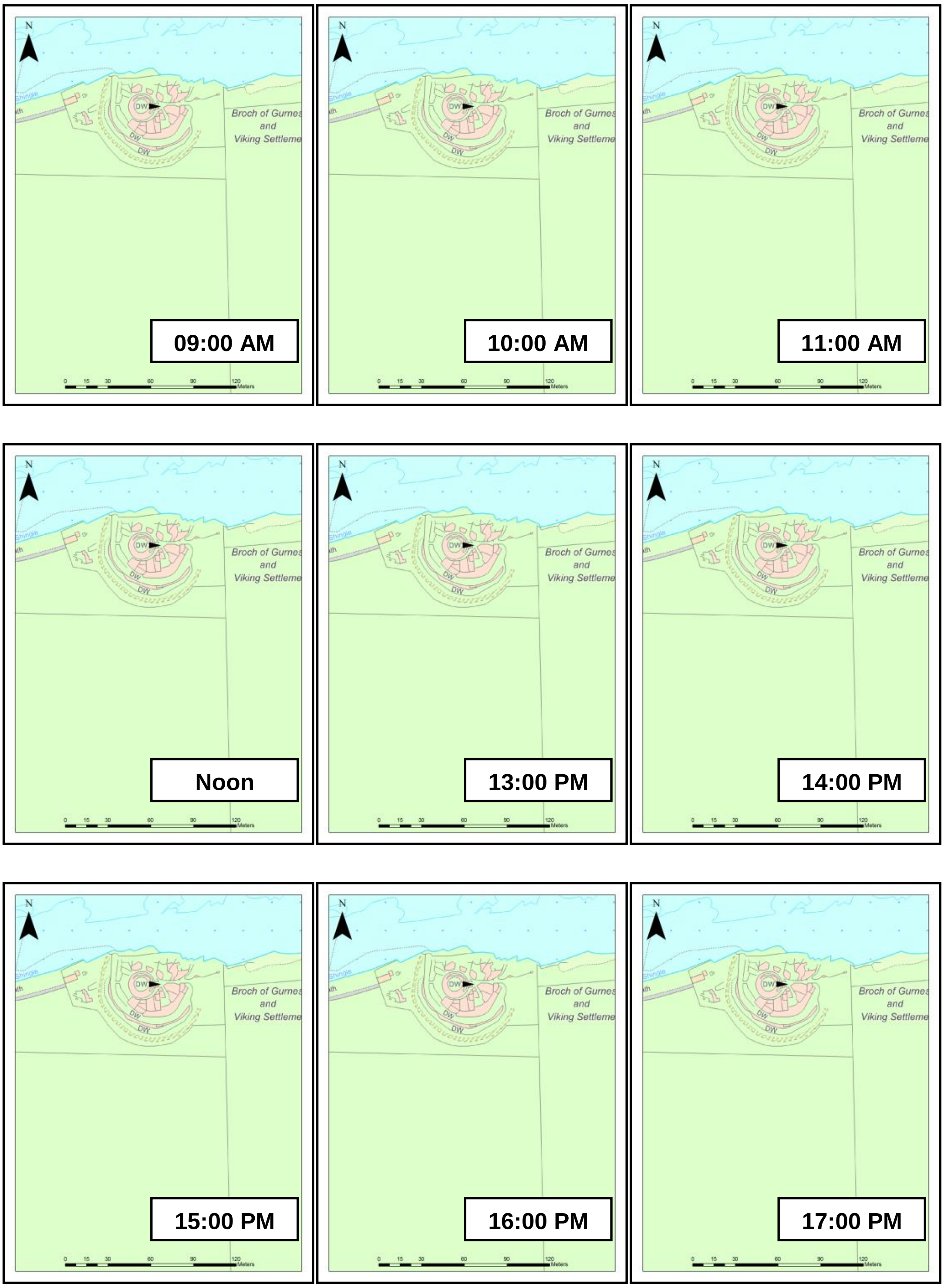
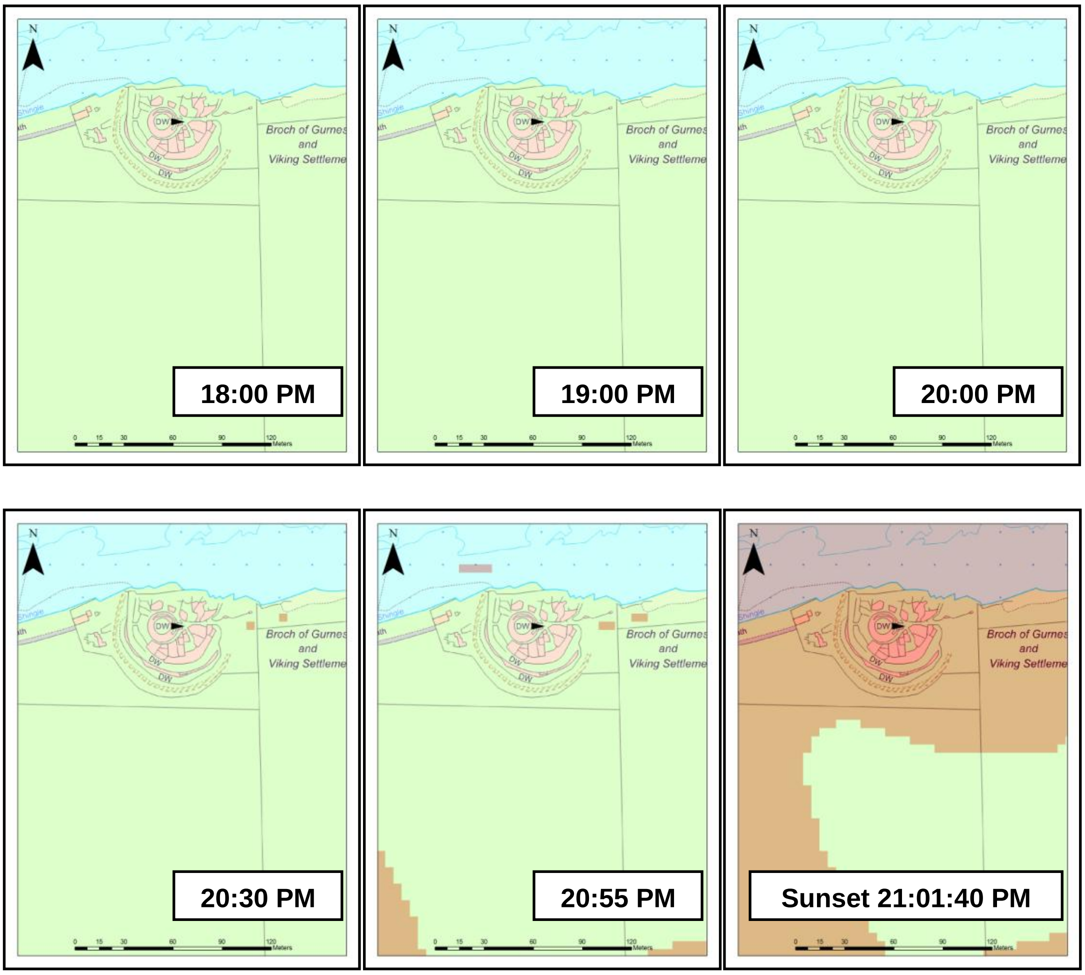


Figure 5.292. 18:00 PM to Sunset (21:01:40 PM) around Gurness on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 5: Burrian Broch

Canmore ID: 1620

Entrance: E

The Broch and its Landscape Context

This broch (Figure 5.293), excavated by Farrer (1870; RCAHMS 1946: 15), is located on the broad outer end of a long, flat promontory projecting out into the Loch of Harray, and thus possesses excellent views down this large stretch of open water (Figure 5.294), especially its northern section. It also has views of the surrounding hills, and other brochs including Harray Churchyard, Scarrataing and North Bigging. Unlike many brochs in Orkney, it does not possess views of the sea.

The Winter Solstice – Figures 5.295 and 5.296

Burrian and its entrance would have gained direct light within the first fifteen minutes of the day, and would have retained it until between 14:30 and 14:37 PM, within fifteen minutes of sunset. Therefore, both a western or eastern entrance would have been suitable.

The Equinox (21st March) – Figures 5.297 and 5.298

Burrian gains direct light within twenty-five minutes of the sun rising at this time of year, retaining it for much of the day, until the last fifteen minutes before sunset. A western entrance would have been marginally more suitable, but only by a couple of minutes.

The Summer Solstice (21st June) Figures 5.299, 5.300 and 5.301

The broch gains light within 20 minutes of sunrise, and it and its landscape retain it for the rest of the day, until about twenty minutes before sunset. Therefore, a western or eastern entrance would both have been equally suitable here, though its eastern entrance facing the landward side may have proven more practical.

Conclusions

Throughout the year, the site and its west and eastern sides would have gained roughly equal amounts of direct light. The eastern entrance was perhaps more practical due to the fact it faces the landward side.

Figure 5.293. Ground Plan of Burrian Broch.
(After: MacKie 2002a: 270: fig. 5.9).

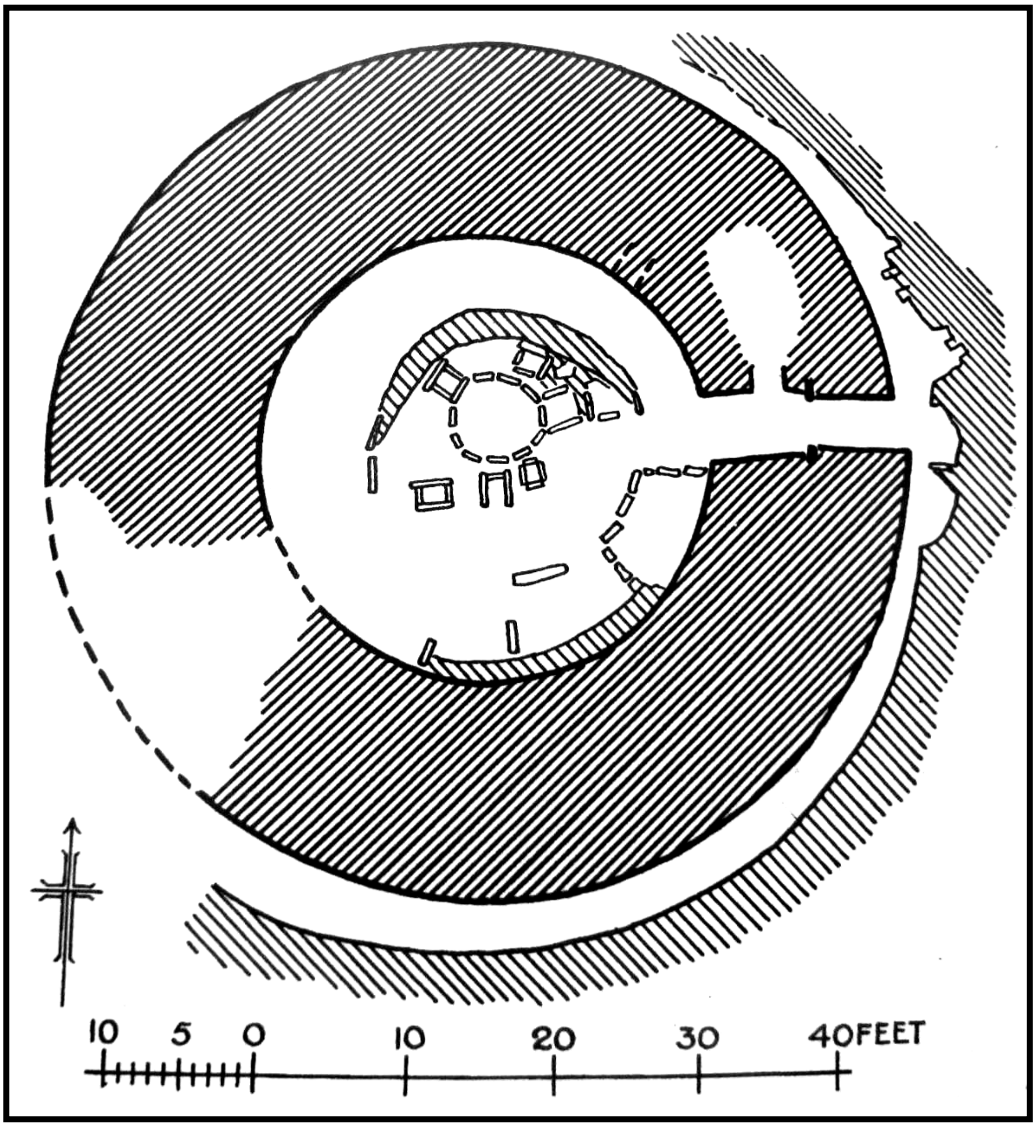


Figure 5.294. Multiple Viewsheds of Burrian Broch.

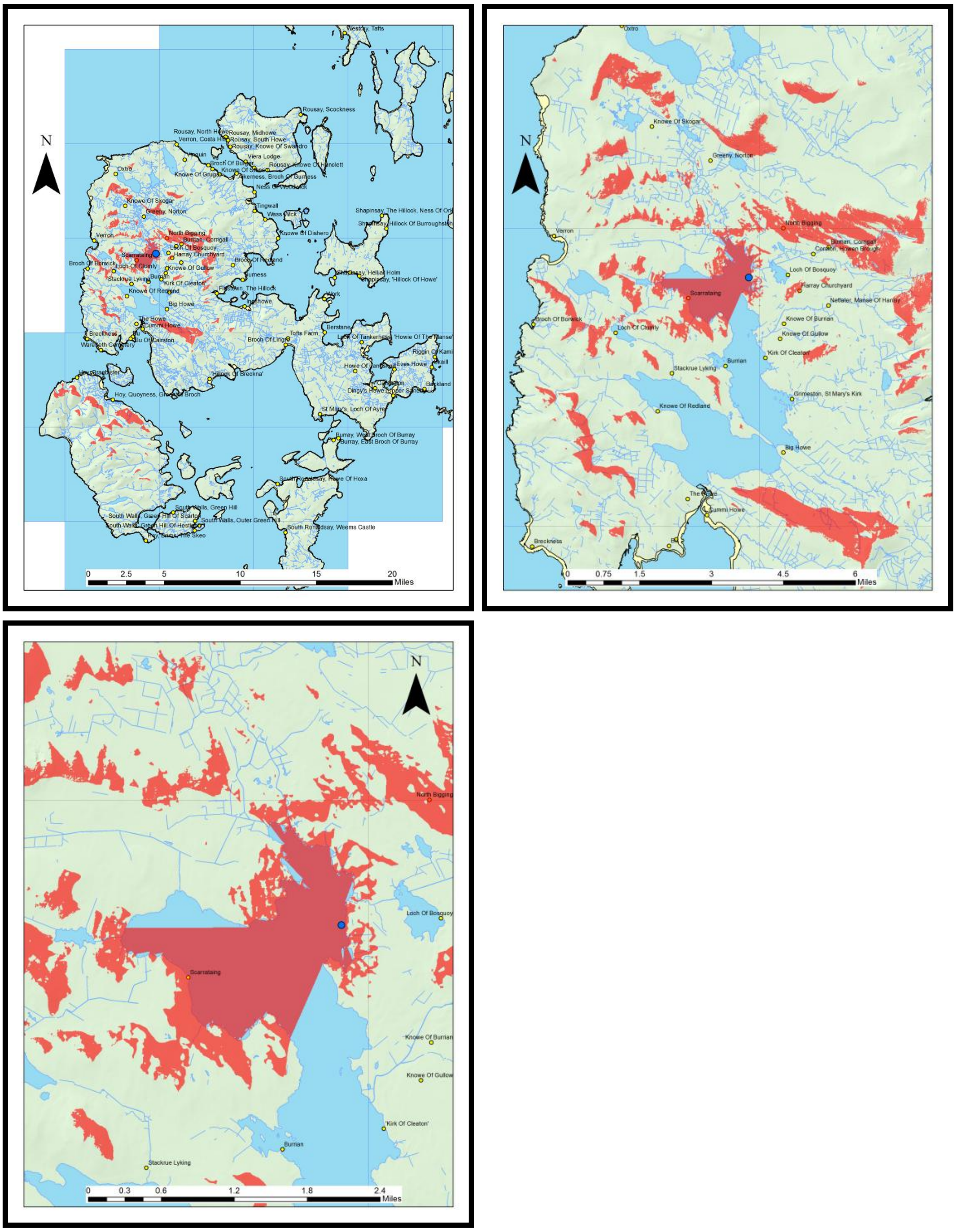


Figure 5.295. Sunrise (08:44 AM) to 13:00 PM around Burrian Broch on the Winter Solstice (21st December). Red areas denote areas of shadow.

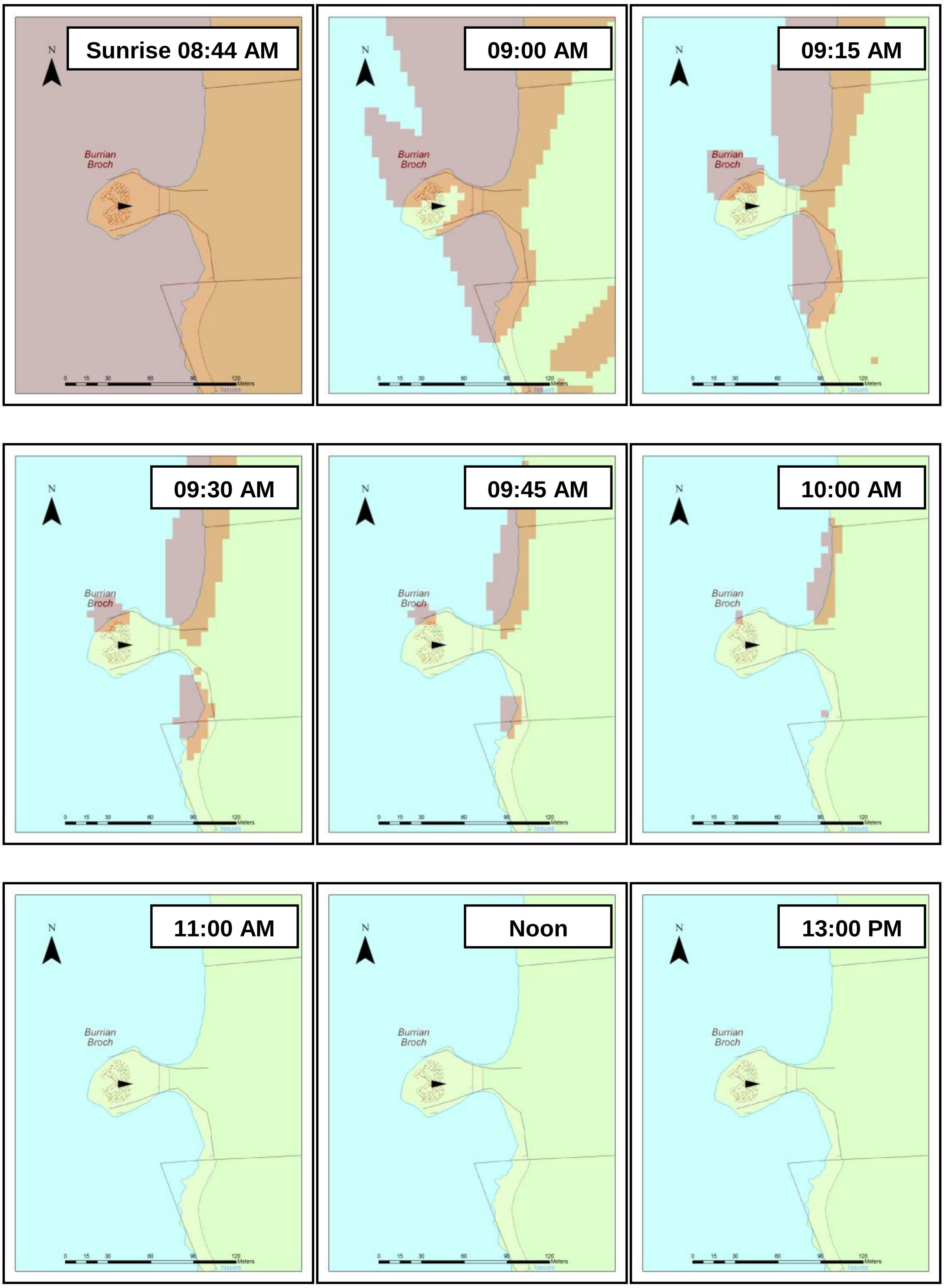


Figure 5.296. 13:30 PM to Sunset (14:47 PM) around on the Winter Solstice (21st December). Red areas denote areas of shadow.

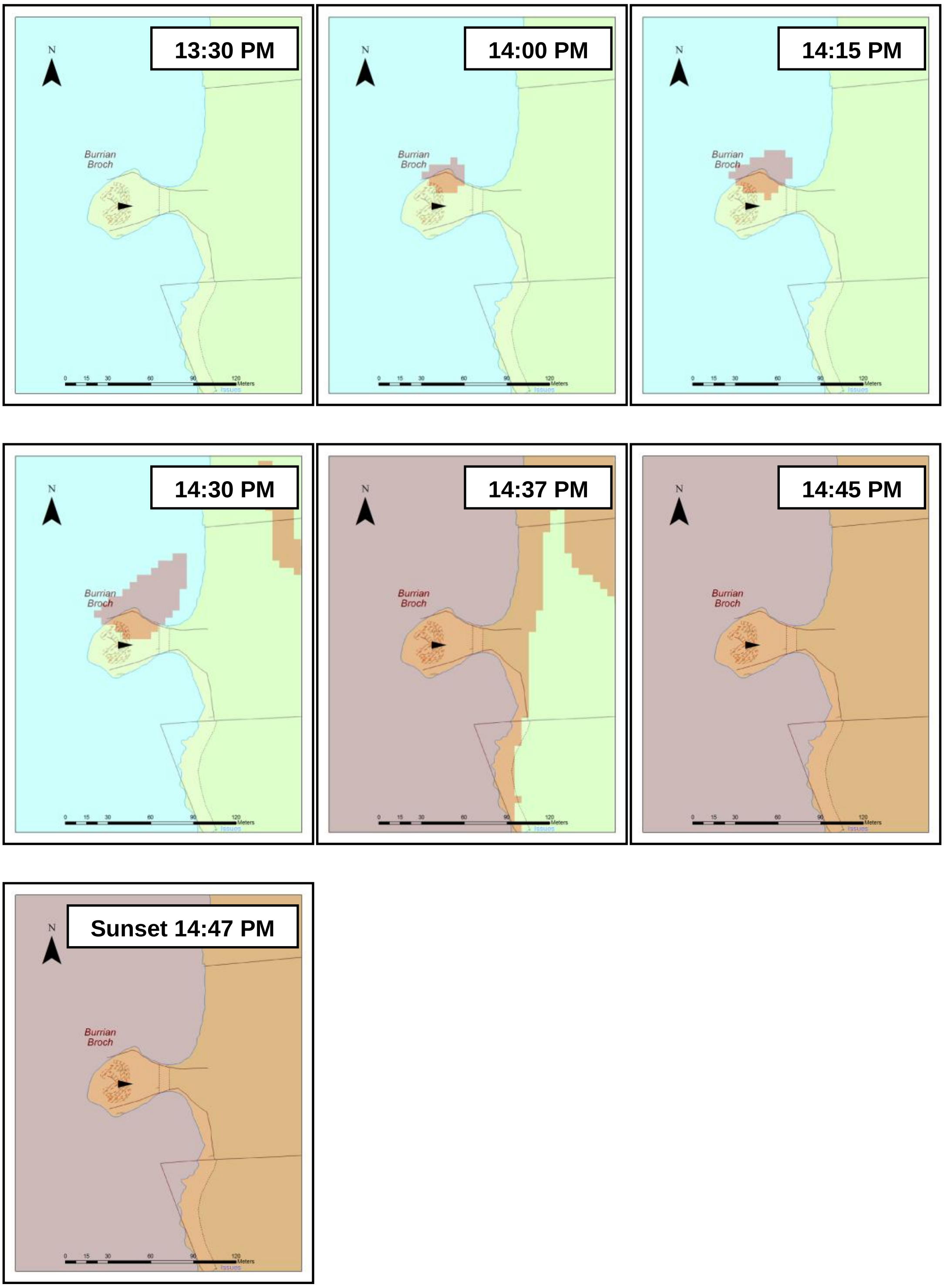


Figure 5.297. Sunrise (05:48 AM) to 11:00 AM around Burrian Broch on the Spring Equinox (21st March). Red areas denote areas of shadow.

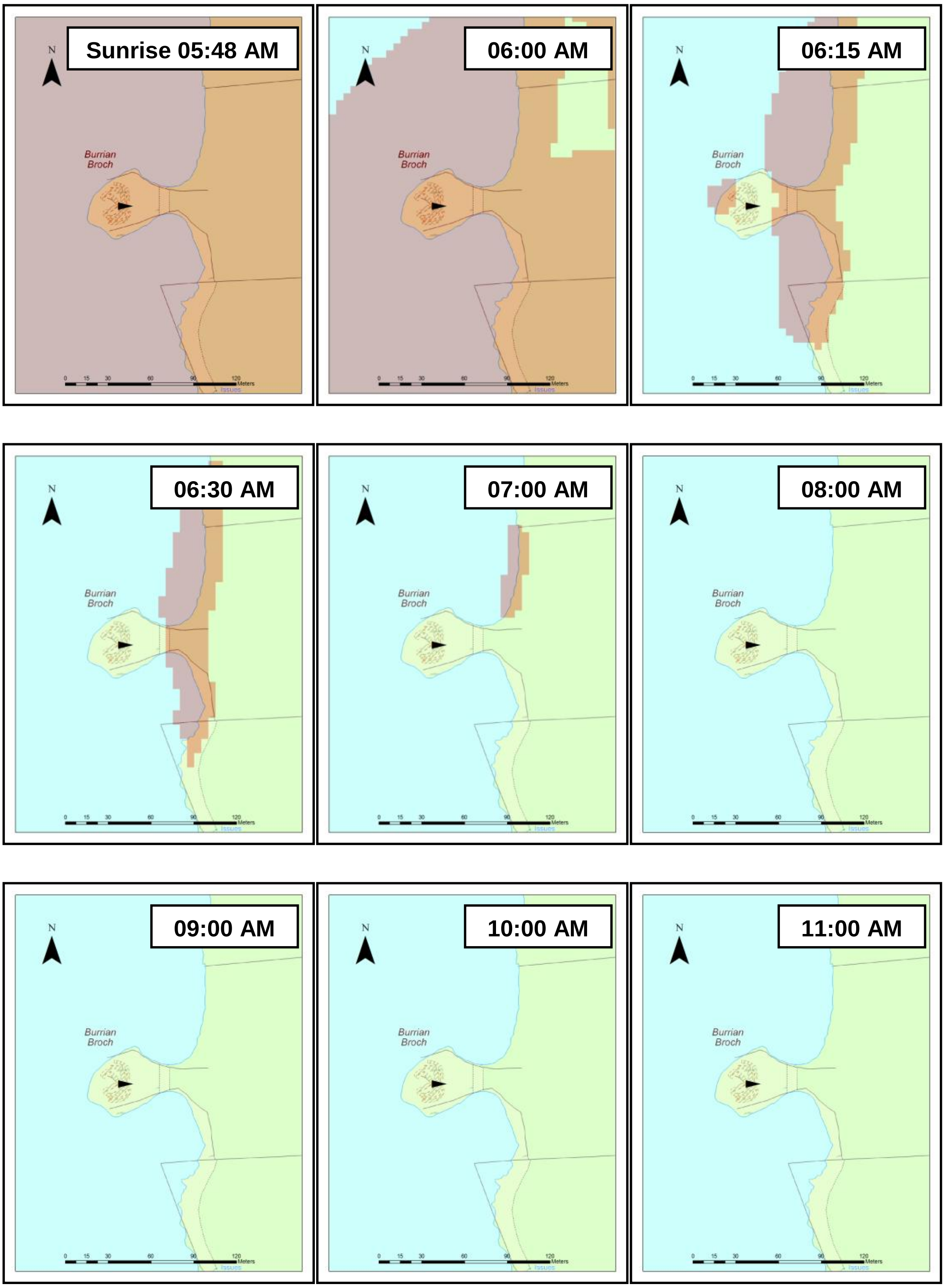


Figure 5.298. Noon to Sunset (18:02:15 PM) around Burrian Broch on the Spring Equinox (21st March). Red areas denote areas of shadow.

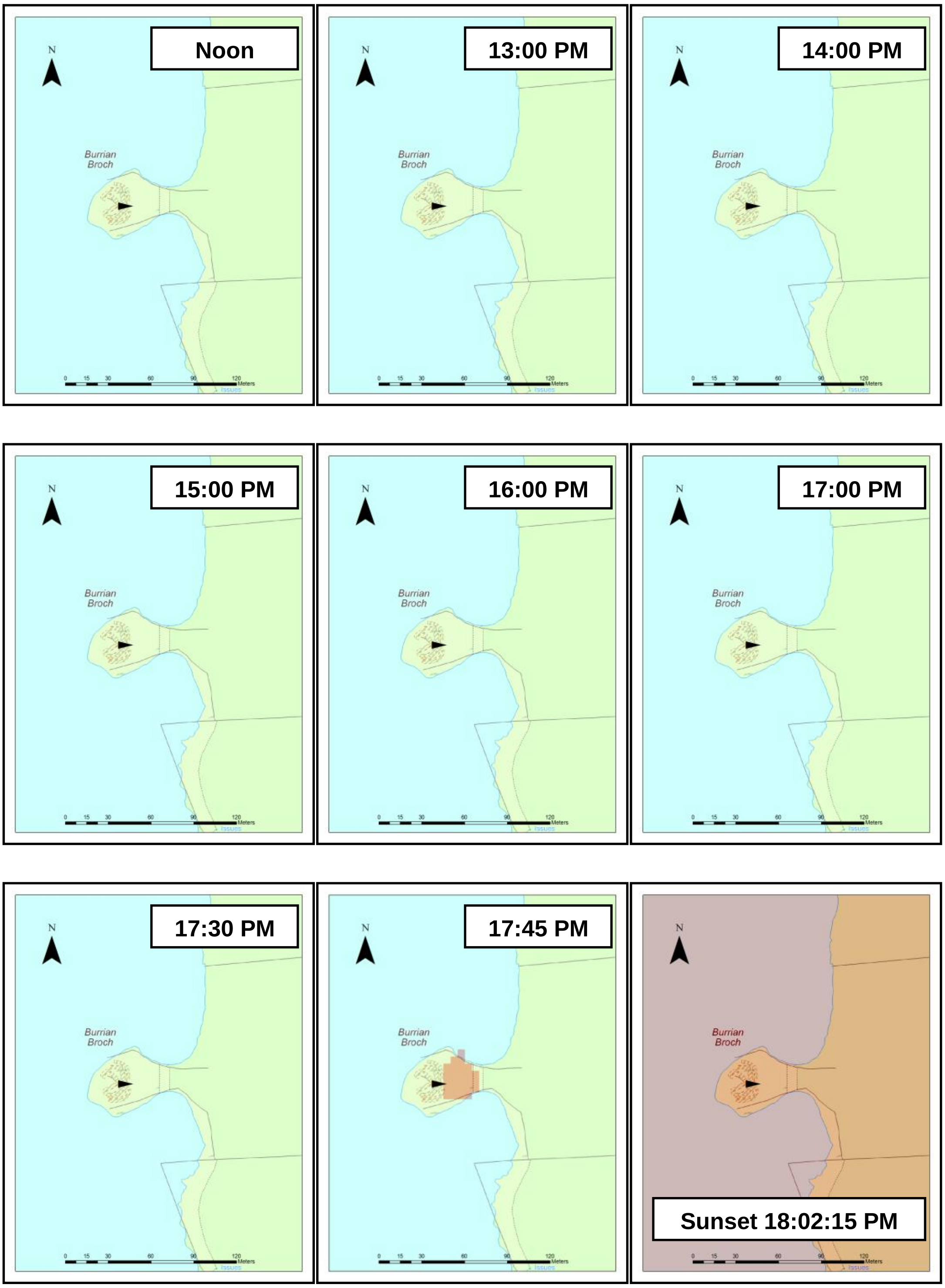


Figure 5.299. Sunrise (02:36:40 AM) to 08:00 AM around Burrian Broch on the Summer Solstice (21st June). Red areas denote areas of shadow.

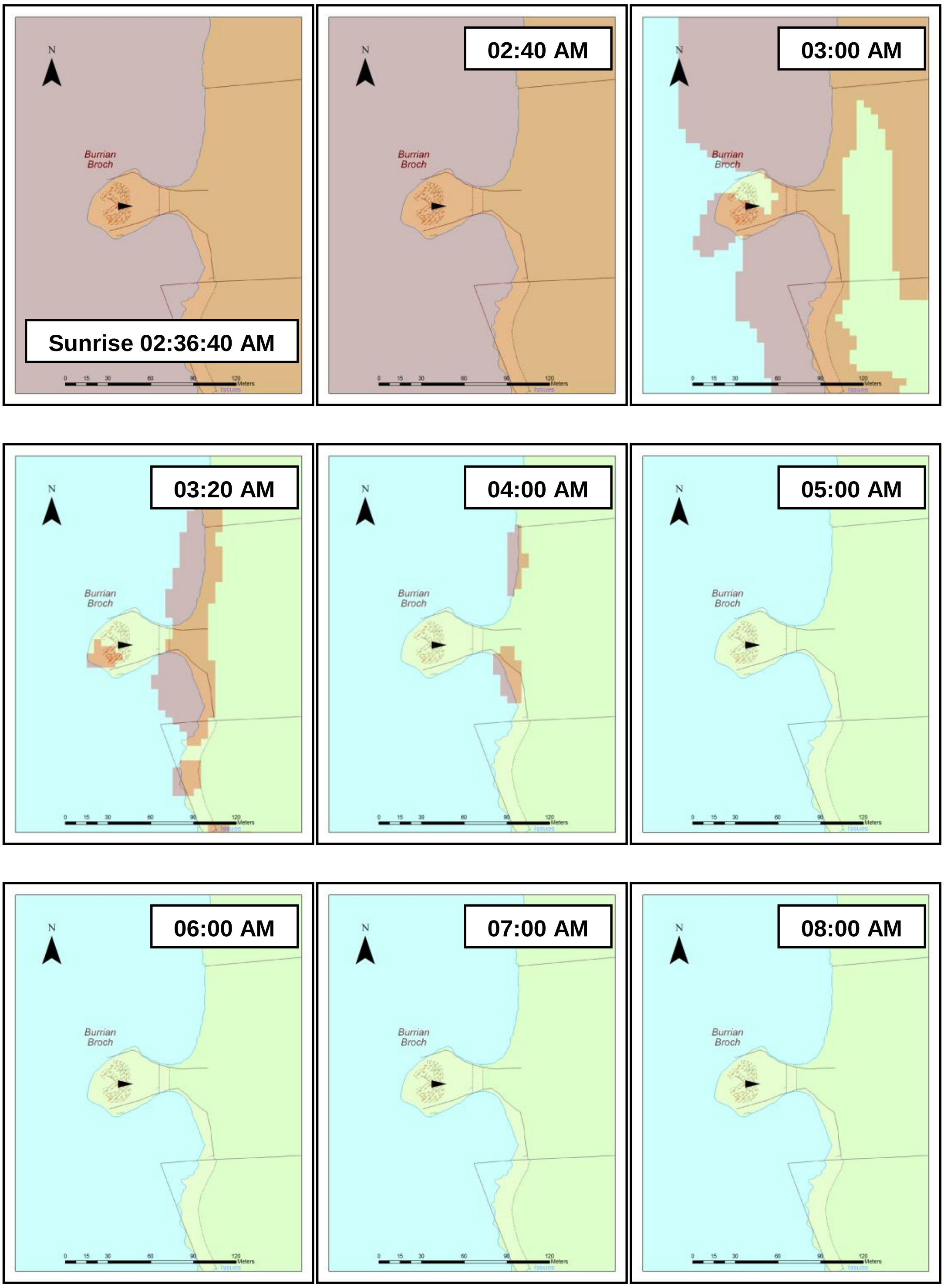


Figure 5.300. 09:00 AM to 17:00 PM around on the Summer Solstice (21st June). Red areas denote areas of shadow.

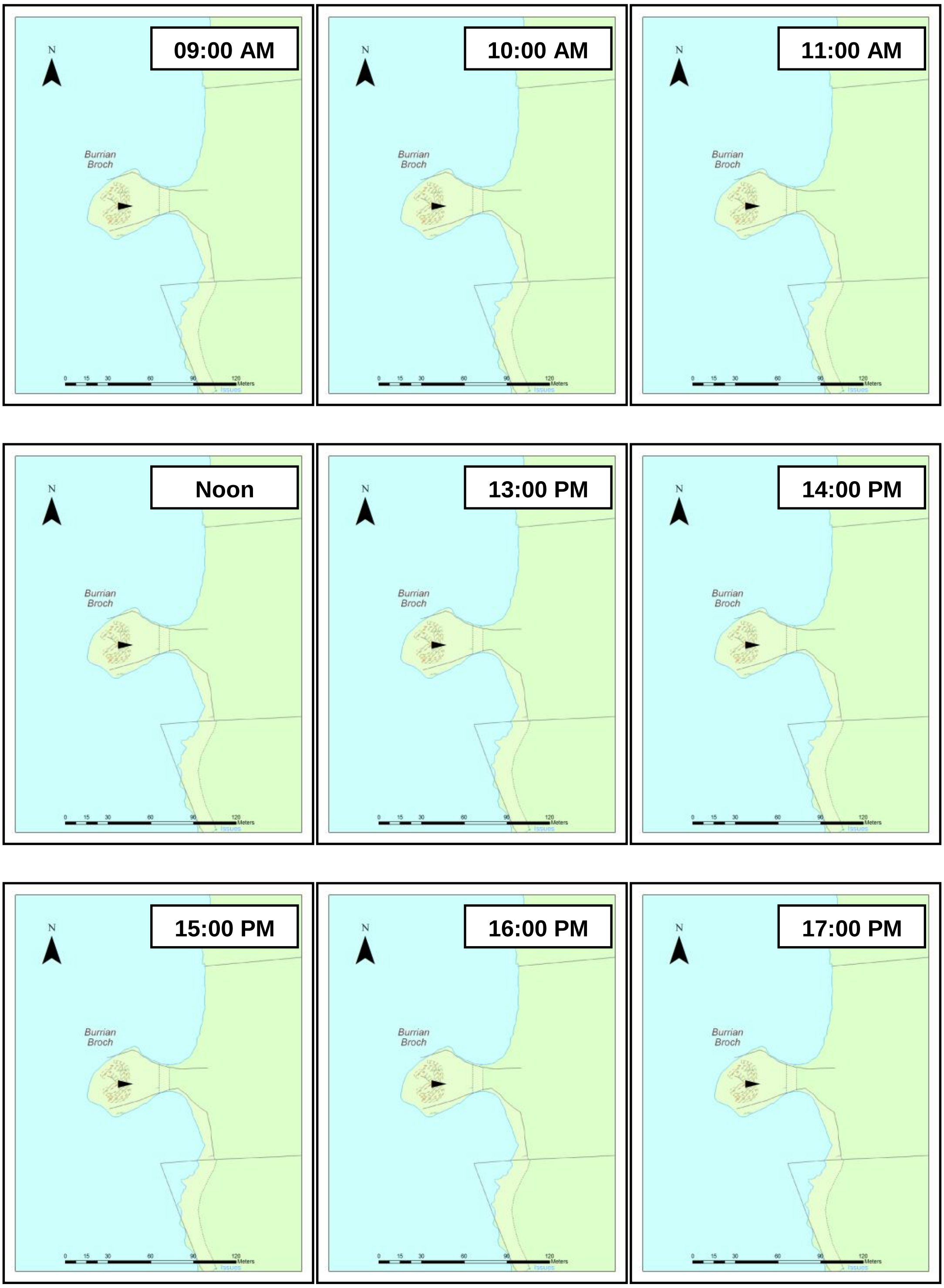
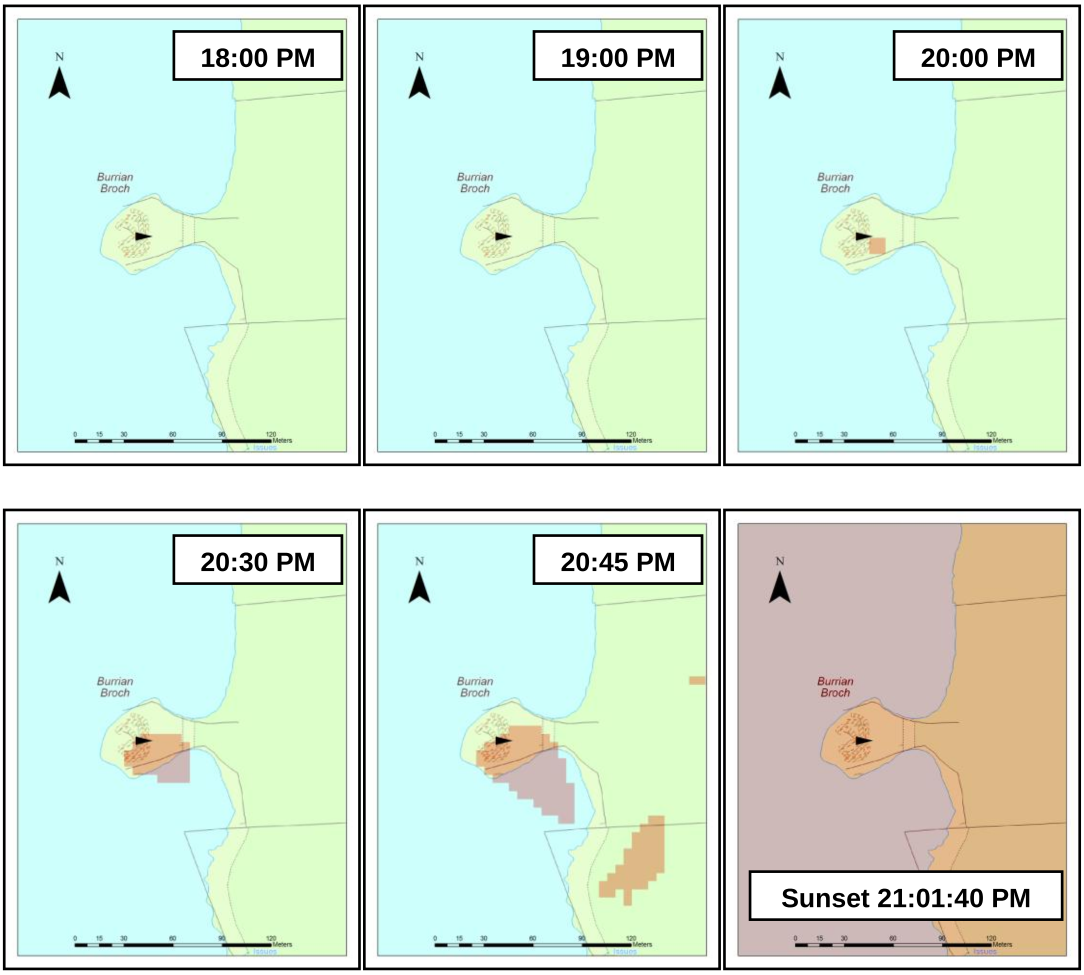


Figure 5.301. 18:00 PM to Sunset (21:01:40 PM) around on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 6: Knowe of Redland

Canmore ID: 1721

Entrance: E

The Broch and its Landscape Context

Excavated in 1866 (RCAHMS 1946: 327), this broch sits overlooking the Loch of Stenness (Figure 5.302), and has good views of this stretch of water, but with views to only one other broch – Stackrue. One can thus assume that a view and the ability to be viewed from the loch were important here.

The Winter Solstice – Figures 5.303 and 5.304

Knowe of Redland gains direct light within half an hour after sunrise, retaining it until between 14:00 and 14:15 PM, probably about forty to thirty-five minutes before sunset. Its eastern entrance is thus marginally better than a possible western.

The Equinox (21st March) – Figures 5.305 and 5.306

The broch gains light within ten minutes after sunrise, retaining it until between 17:30 and 17:45 PM, about at least twenty minutes before sunset. Again, its eastern entrance is optimal for this time of year.

The Summer Solstice (21st June) Figures 5.307, 5.308 and 5.309

The site gains light within 20 minutes after sunrise, retaining it for the entire day, until between 20:45 and 20:55 PM, about fifteen before sunset. A western entrance may have been slightly better here, therefore.

Conclusions

Like many brochs in Orkney, any orientation between the west, south and east would have been equally beneficial. The east may have been chosen here because of its marginally better light availability throughout most of the year.

Figure 5.302. Multiple Viewsheds of Knowe of Redland

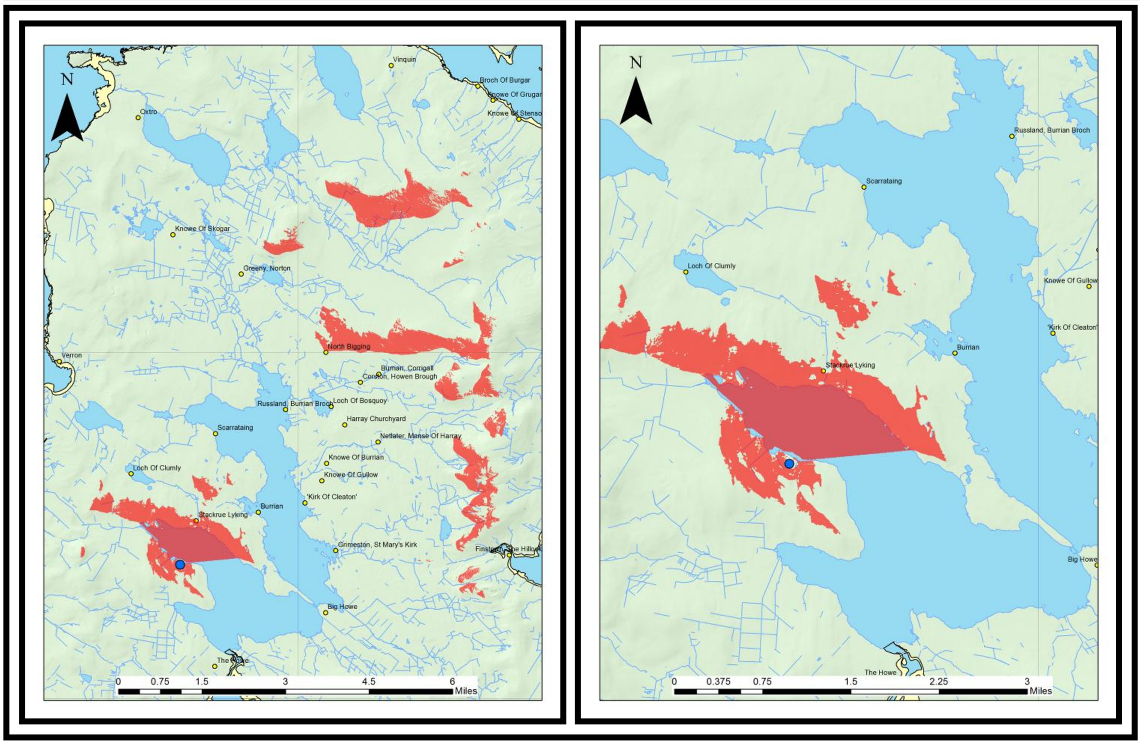


Figure 5.303. Sunrise (08:44 AM) to 13:00 PM around Knowe of Redland on the Winter Solstice (21st December). Red areas denote areas of shadow.

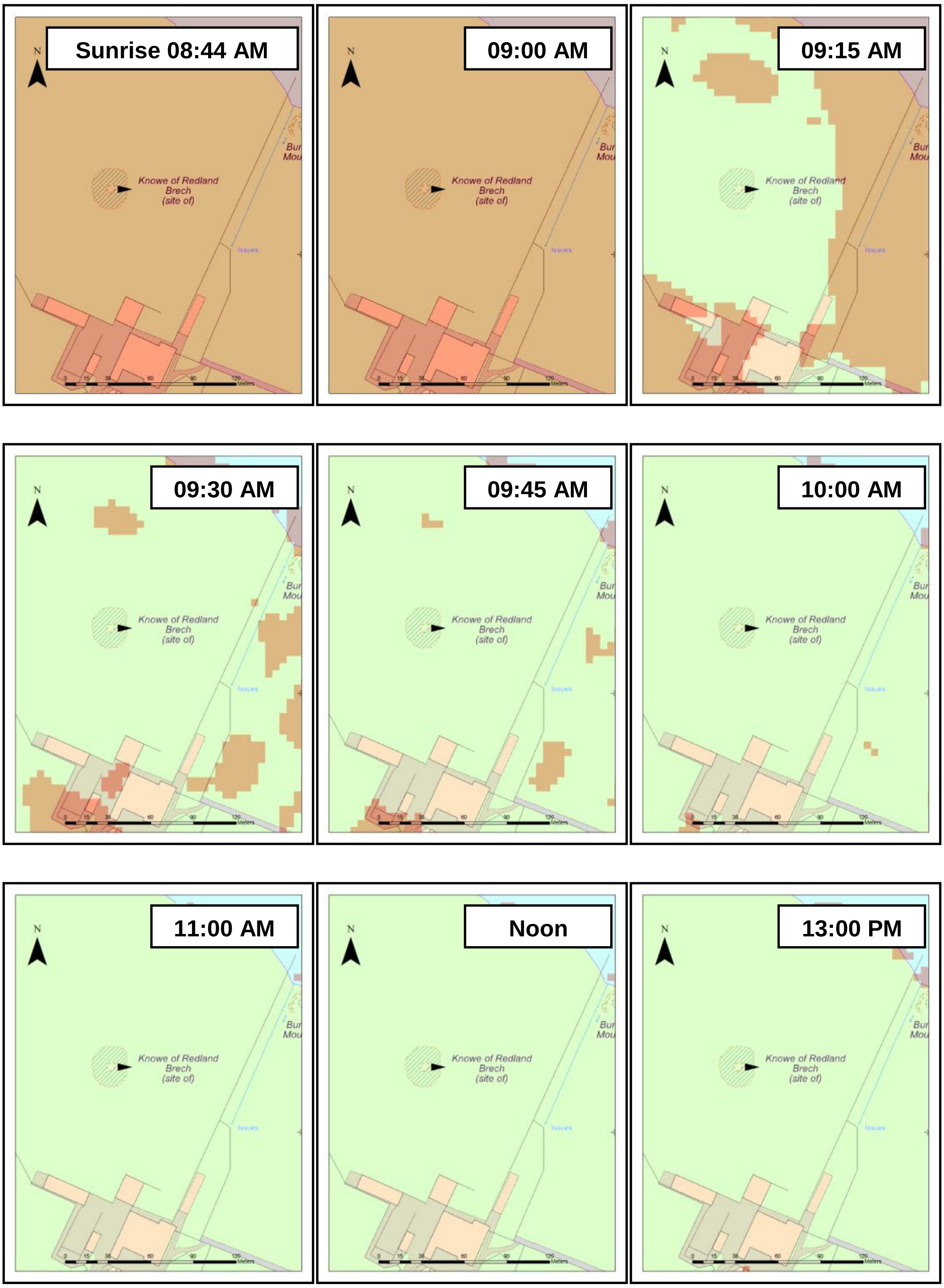


Figure 5.304. 13:30 PM to Sunset (14:47 PM) around Knowe of Redland on the Winter Solstice (21st December). Red areas denote areas of shadow.

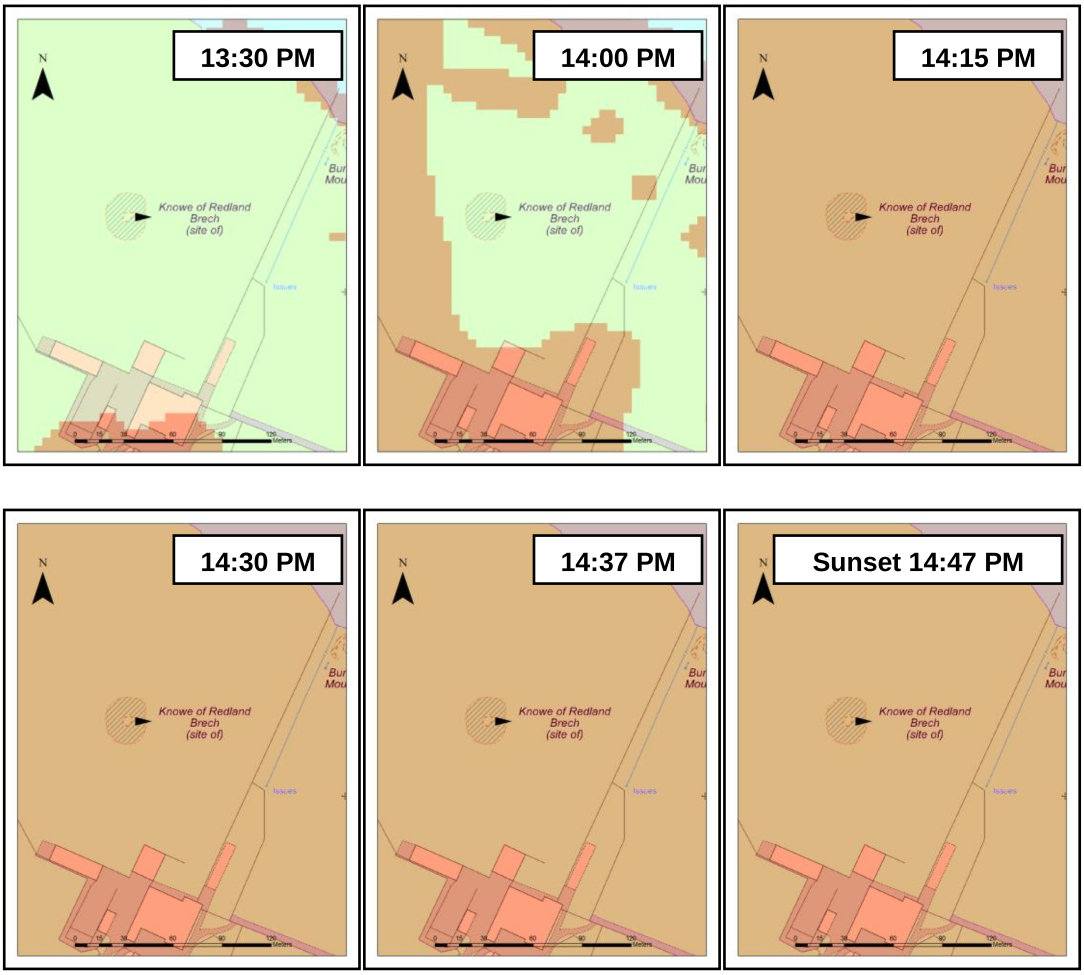


Figure 5.305. Sunrise (05:48 AM) to 11:00 AM around Knowe of Redland on the Spring Equinox (21st March). Red areas denote areas of shadow.

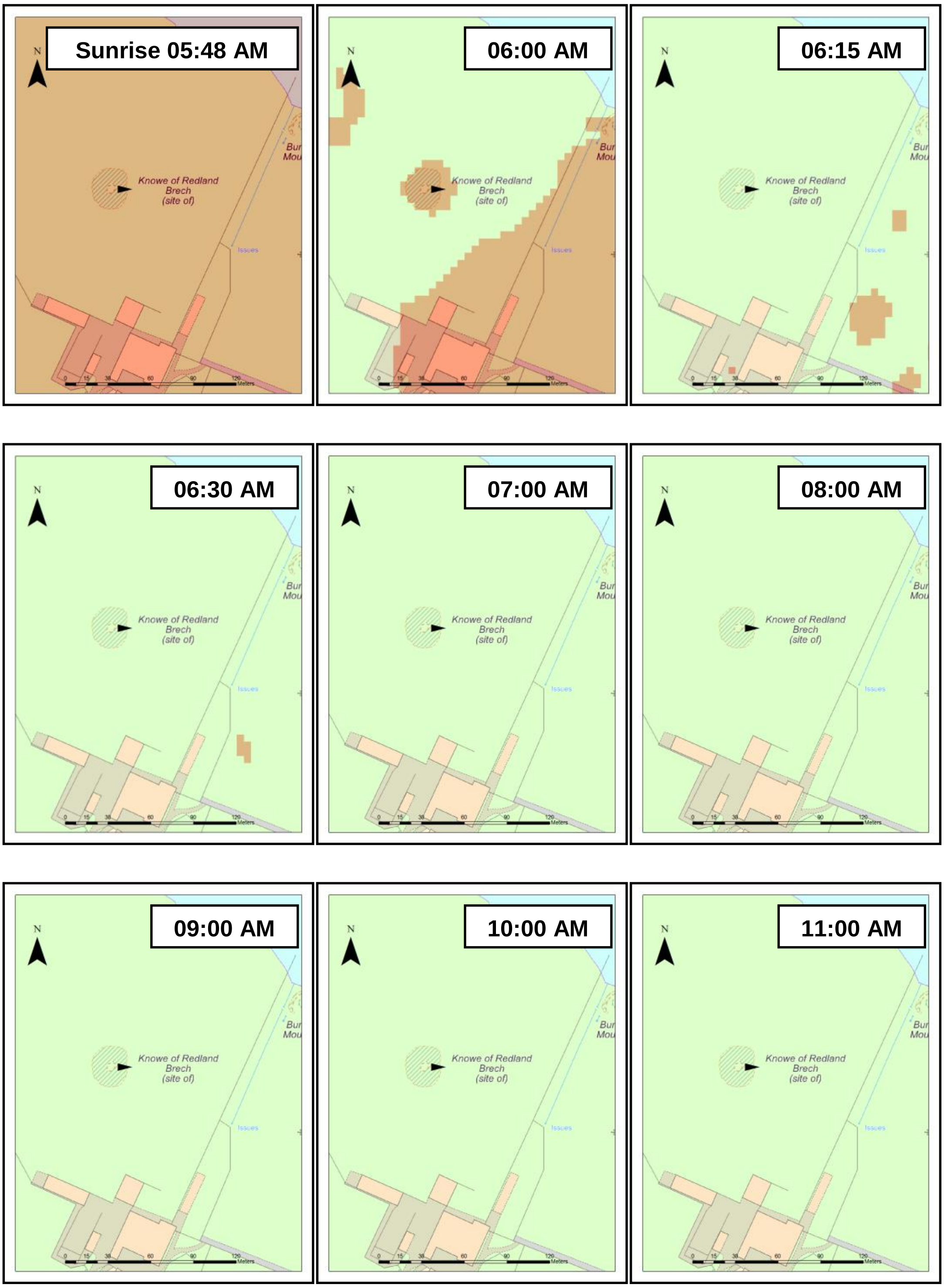


Figure 5.306. Noon to Sunset (18:02:15 PM) around Knowe of Redland on the Spring Equinox (21st March). Red areas denote areas of shadow.

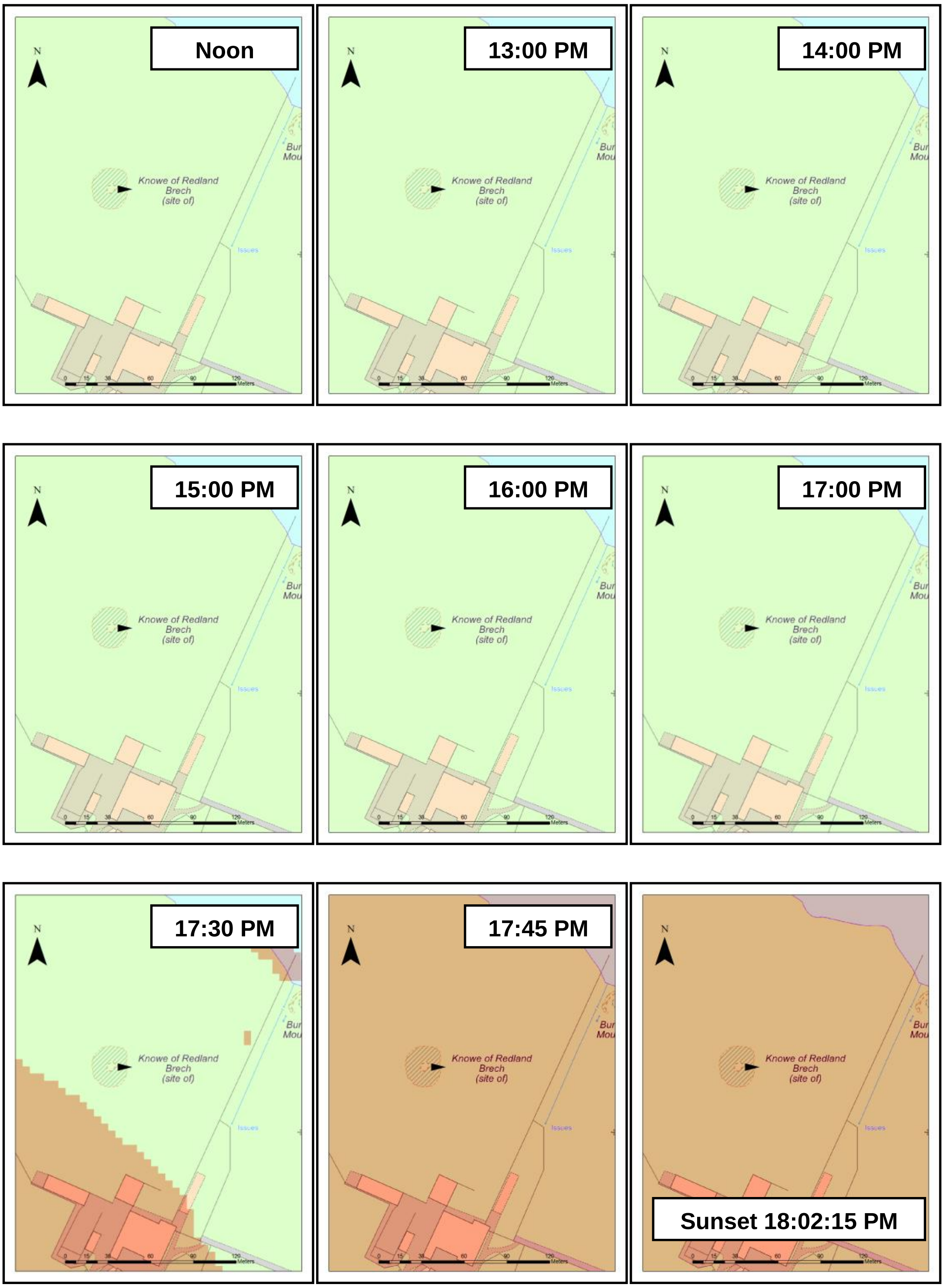


Figure 5.307. Sunrise (02:36:40 AM) to 08:00 AM around Knowe of Redland on the Summer Solstice (21st June). Red areas denote areas of shadow.

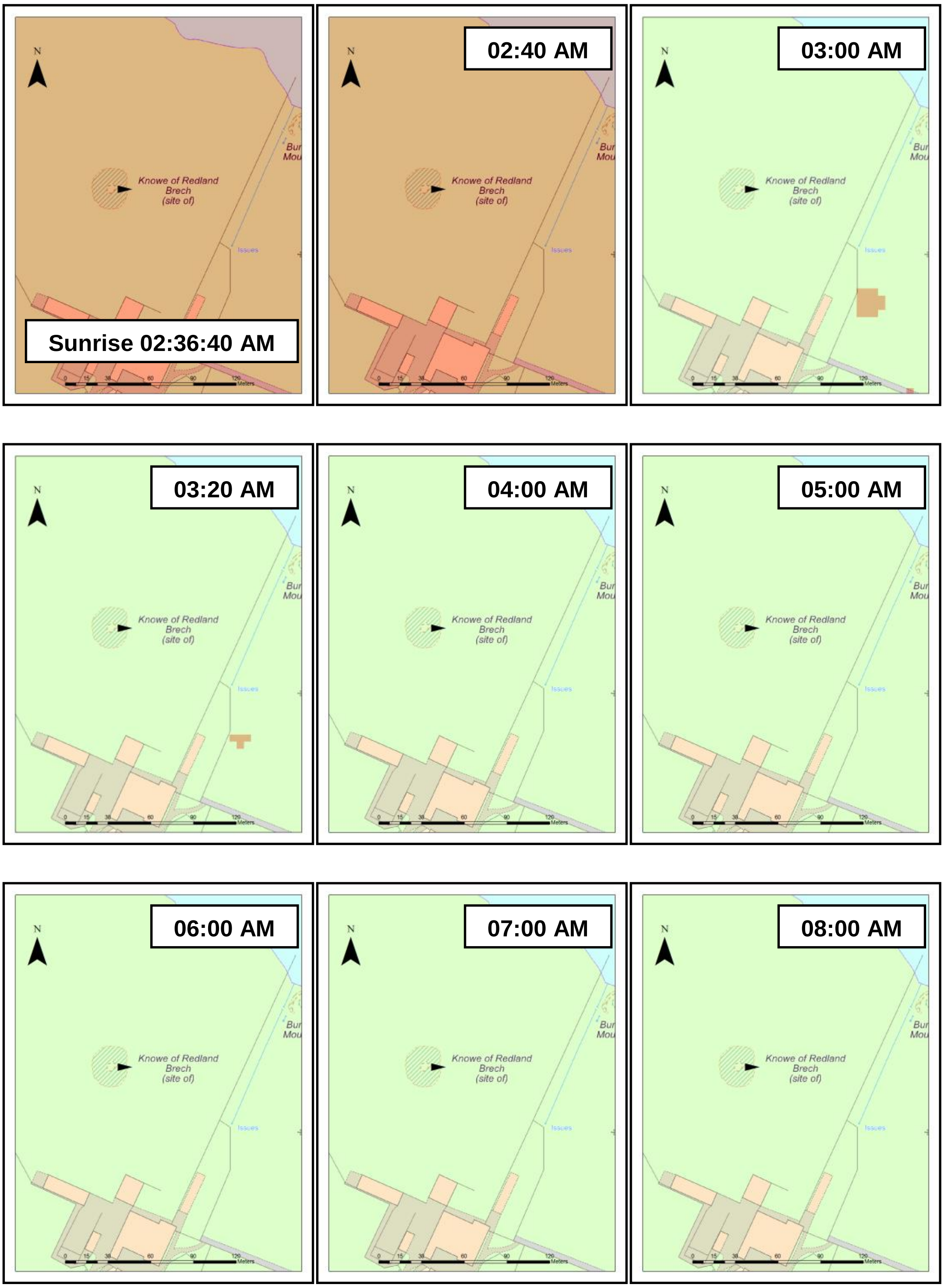


Figure 5.308. 09:00 AM to 17:00 PM around Knowe of Redland on the Summer Solstice (21st June). Red areas denote areas of shadow.

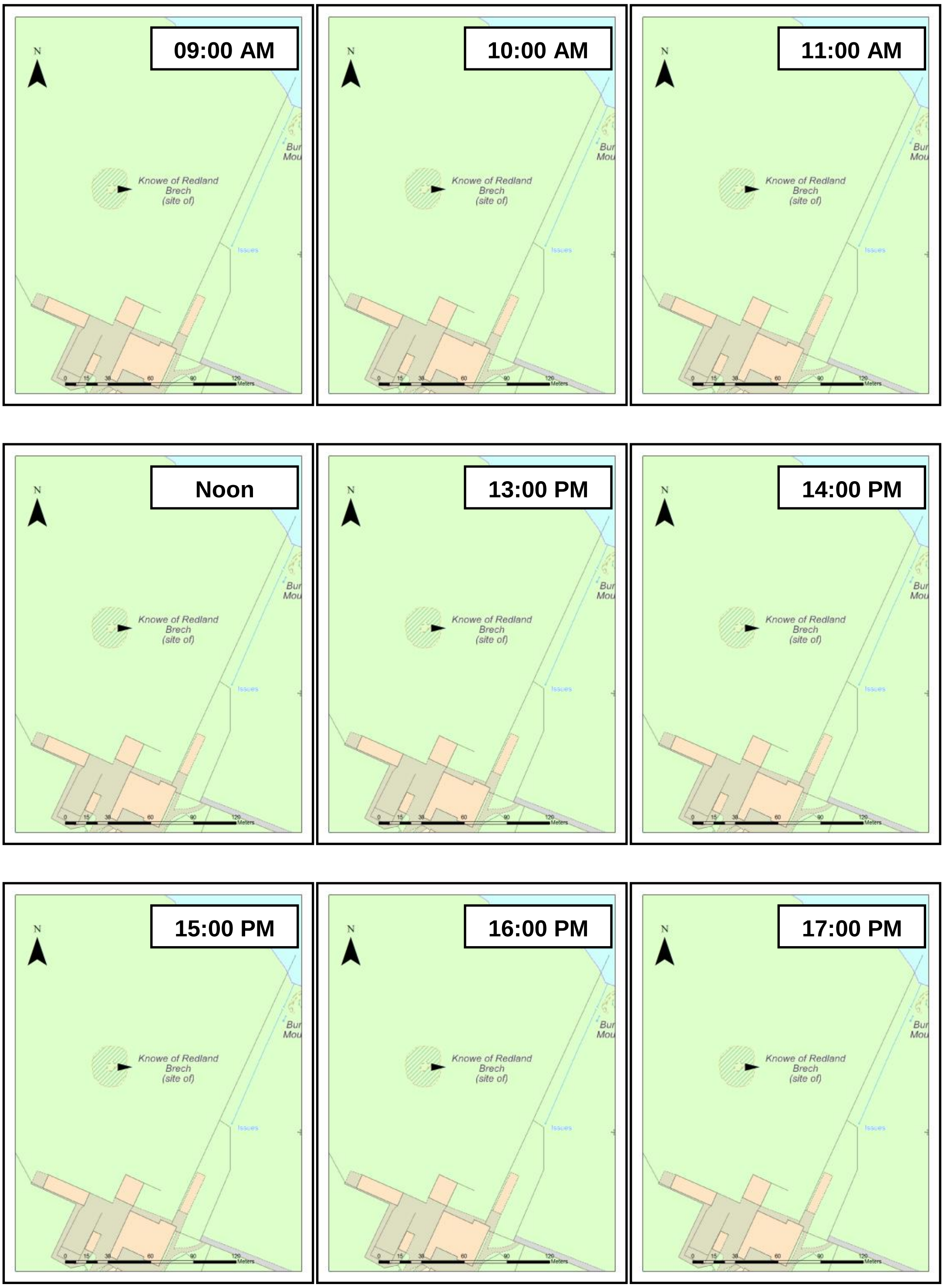
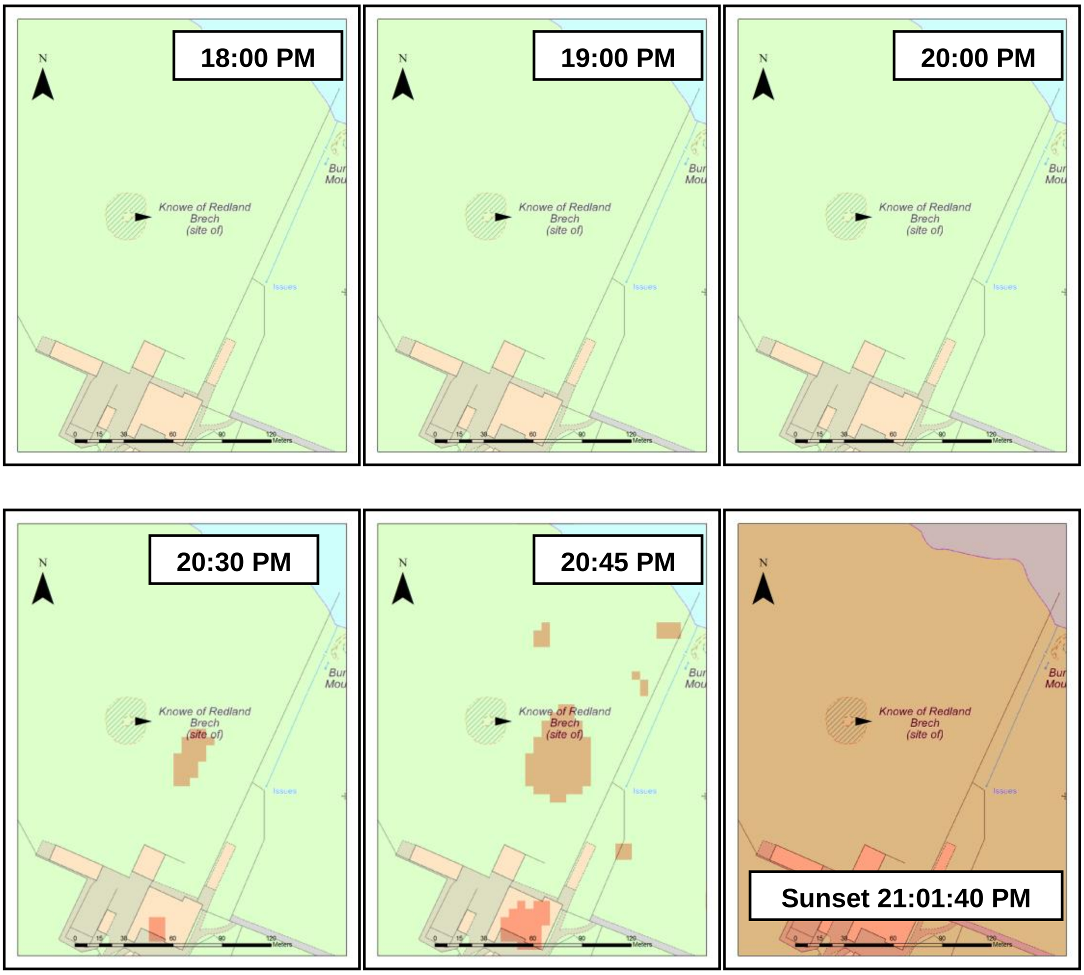


Figure 5.309. 18:00 PM to Sunset (21:01:40 PM) around on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 7: Loch of Ayre

Canmore ID: 2387

Entrance: ESE

The Broch and its Landscape Context

Excavated in 1901-2 (Graeme 1914), this broch (Figures 5.310, 5.311 and 5.312) stands next to, or is even within, the Loch of Ayre and is very close to the shore. Though limited in its views of Mainland (Figure 313), it has views down the eastern side of Scapa Flow, looking over the western shores of the islands, as well as views towards the two broch on Burray, and the Howe of Hoxa on South Ronaldsay. As such, it was obviously intended to view and be viewed by those upon the sea approaching or leaving Scapa Flow through the gap of Burray.

The Winter Solstice – Figures 5.314 and 5.315

The broch is in daylight probably between five and ten minutes after sunrise, and it and its landscape retain it for the day, until just before 14:37 PM, about ten minutes before sunset. Its entrance was thus well suited to this time of year.

The Equinox (21st March) – Figures 5.316 and 5.317

The broch gains direct light between ten and twenty-five minutes after sunrise, retaining it for the day, until about 17:45 PM, probably about ten minutes before sunset. For this time of year, a western entrance may have been only marginally better, but not by more than a couple of minutes.

The Summer Solstice (21st June) – Figures 5.318, 5.319 and 5.320

The site gains light between 03:00 and 03:20 AM, between twenty and thirty minutes after sunrise, retaining it for the day thereafter. The site loses its light about fifteen minutes before sunset, and so a western entrance would have been marginally more suitable.

Conclusions

Again, the orientation and site location is well suited to this area and latitude, gaining the most amount of light in winter, while also being suitable for the rest of the year, even if a western entrance would have gained mere minutes more daylight.

Figure 5.310. Loch of Ayre broch.
Author's Photo.

Figure 5.311. View down the loch from Loch of Ayre broch.
Author's Photo.

Figure 5.312. Ground Plan of Broch of Loch of Ayre.
(After: Graeme 1914: 32: fig. 1).

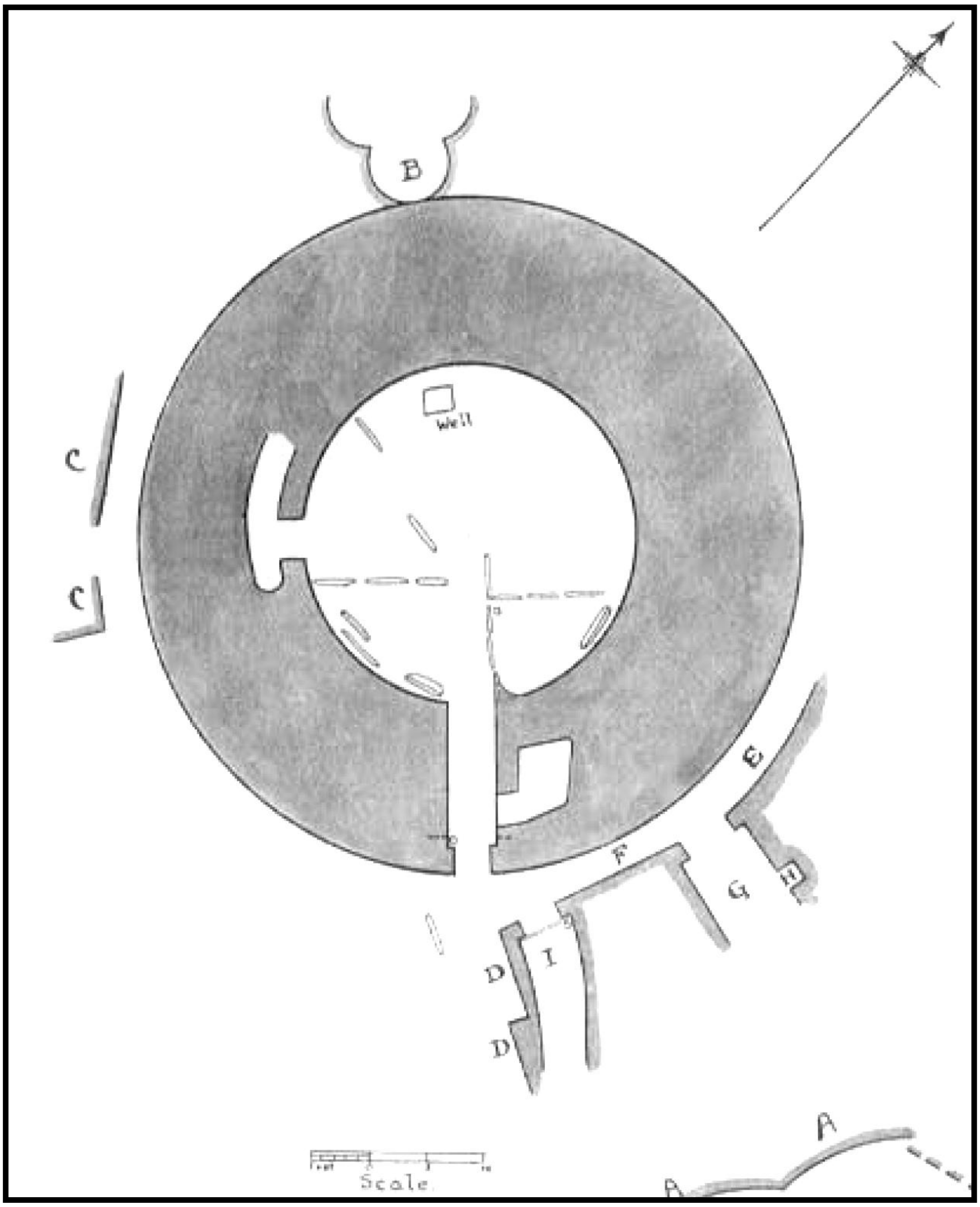


Figure 5.313. Multiple Viewsheds of Loch of Ayre

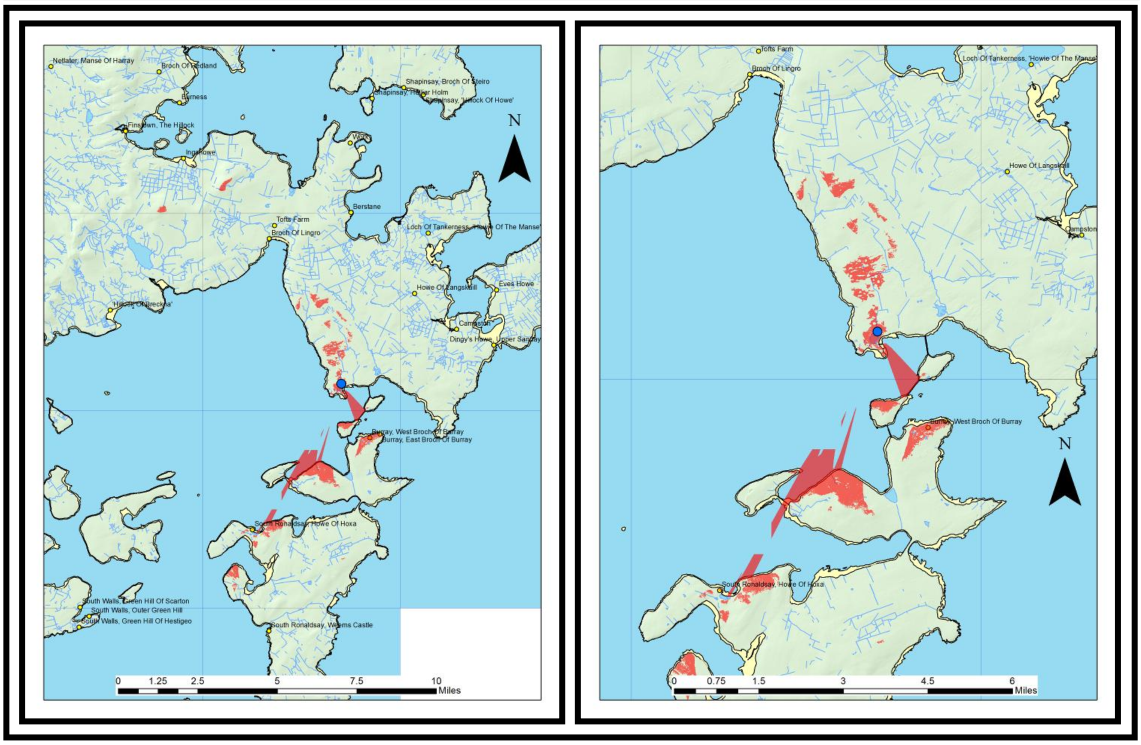


Figure 5.314. Sunrise (08:44 AM) to 13:00 PM around Loch of Ayre on the Winter Solstice (21st December). Red areas denote areas of shadow.

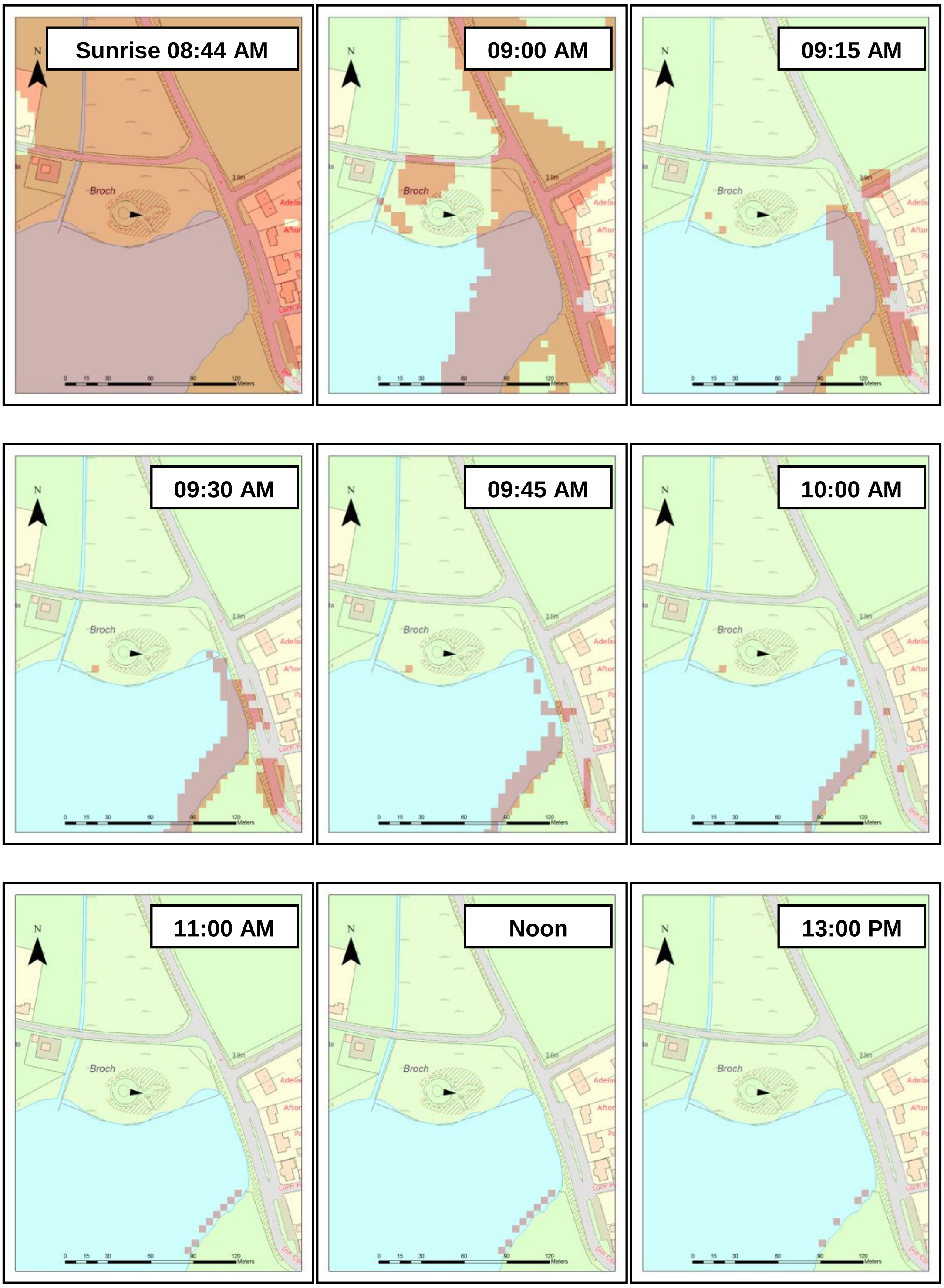


Figure 5.315. 13:30 PM to Sunset (14:47 PM) around Loch of Ayre on the Winter Solstice (21st December). Red areas denote areas of shadow.

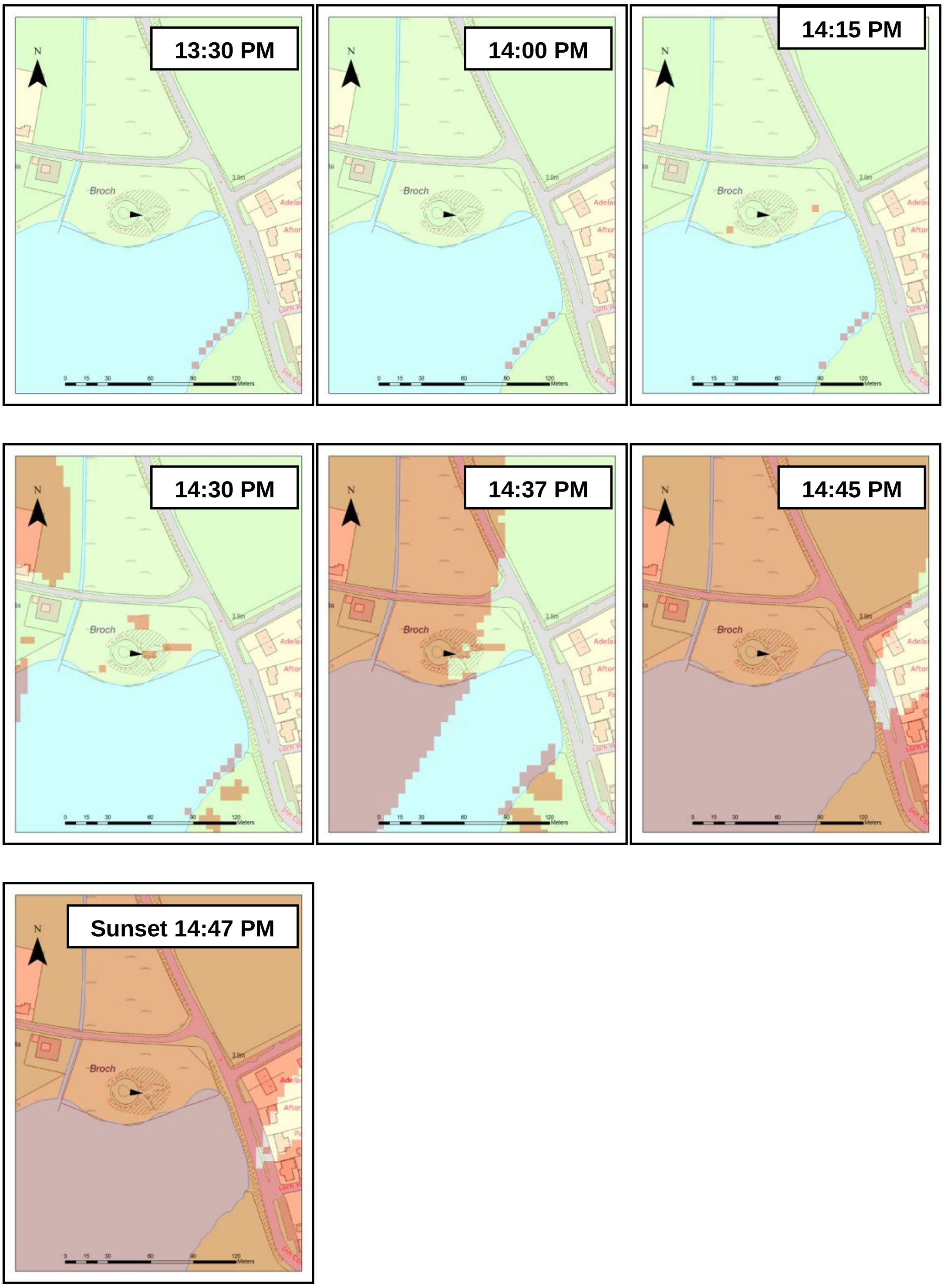


Figure 5.316. Sunrise (05:48 AM) to 11:00 AM around Loch of Ayre on the Spring Equinox (21st March). Red areas denote areas of shadow.

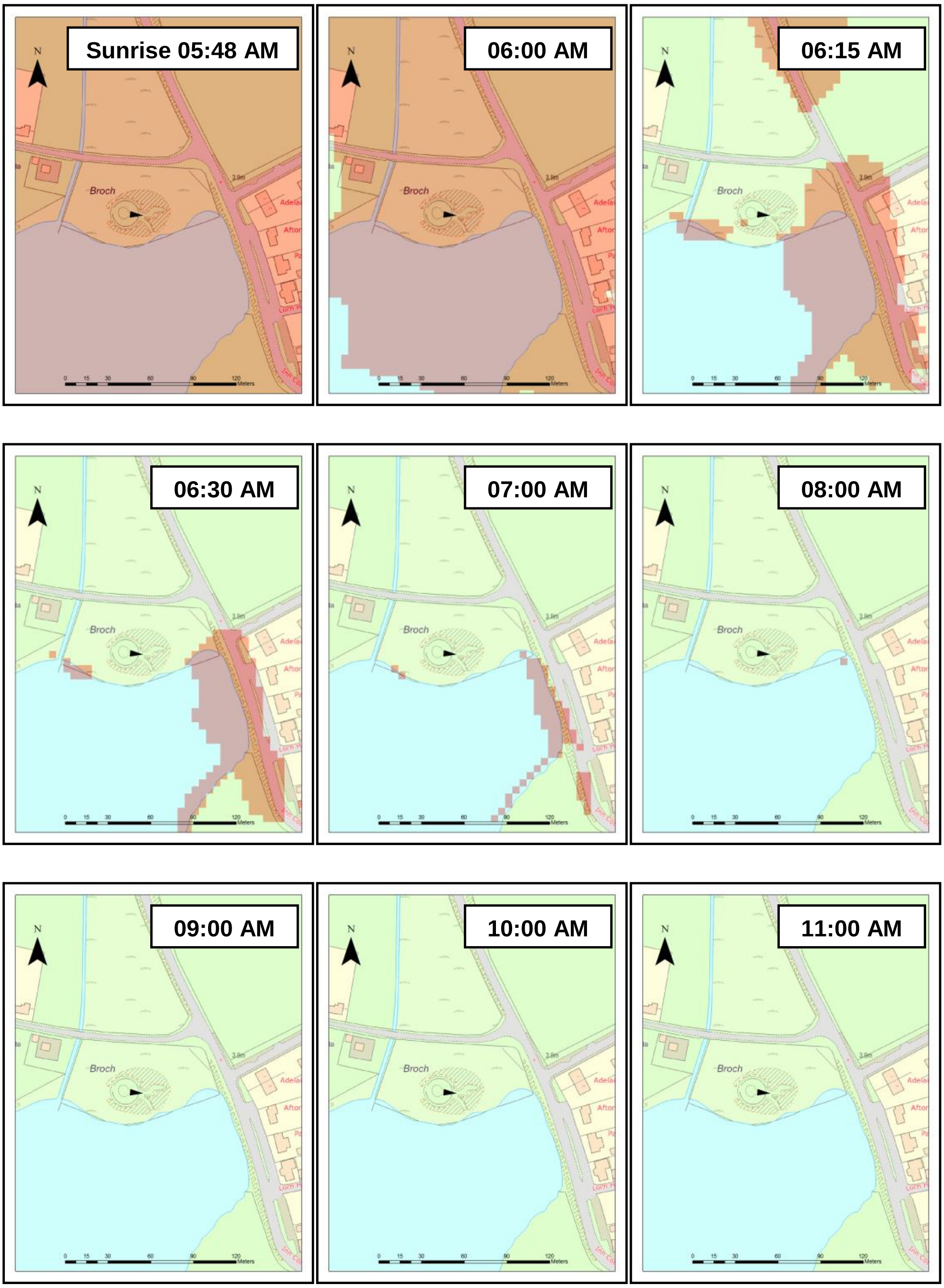


Figure 5.317. Noon to Sunset (18:02:15 PM) around Loch of Ayre on the Spring Equinox (21st March). Red areas denote areas of shadow.

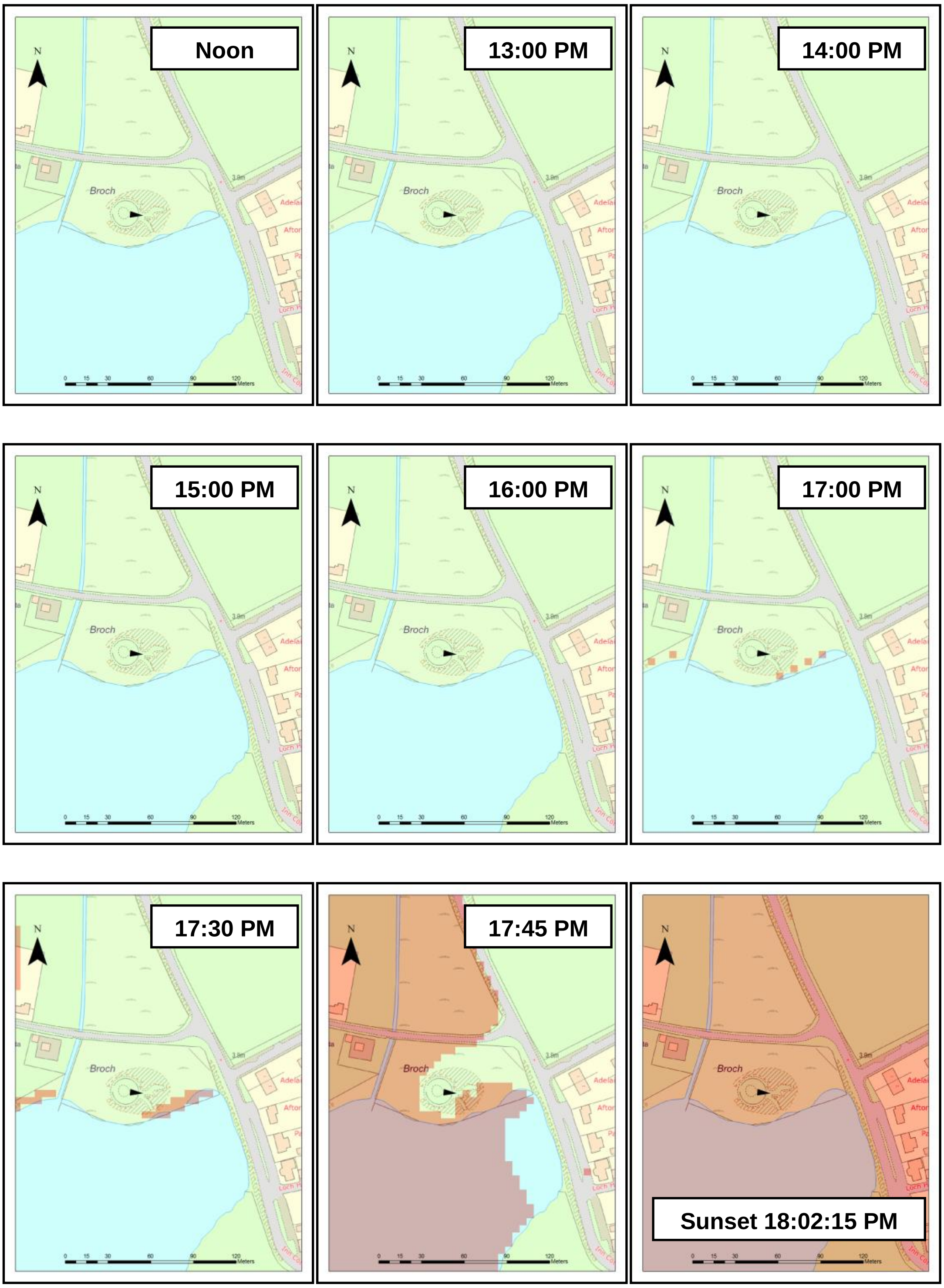


Figure 5.318. Sunrise (02:36:40 AM) to 08:00 AM around Loch of Ayre on the Summer Solstice (21st June). Red areas denote areas of shadow.

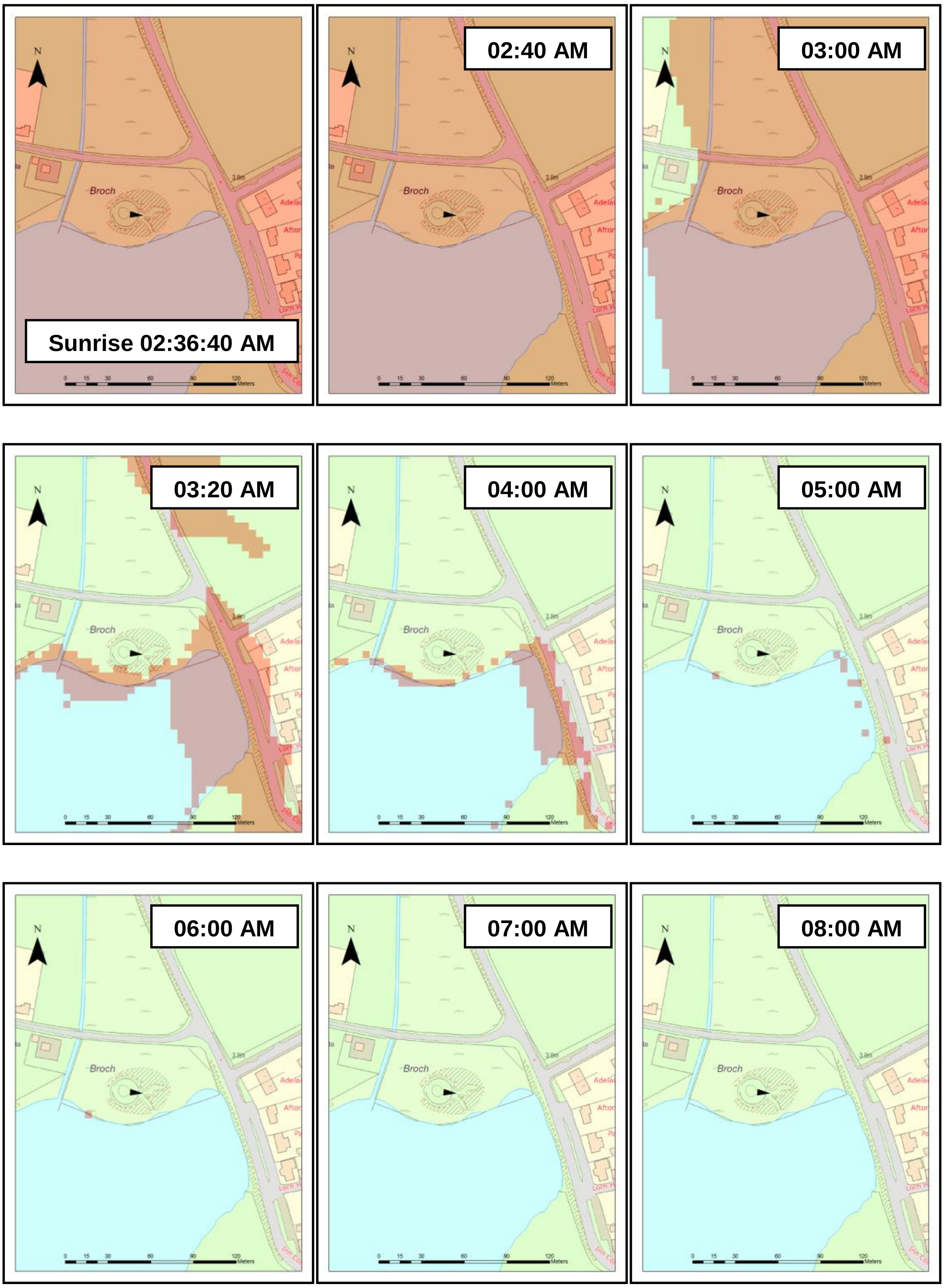


Figure 5.319. 09:00 AM to 17:00 PM around Loch of Ayre on the Summer Solstice (21st June). Red areas denote areas of shadow.

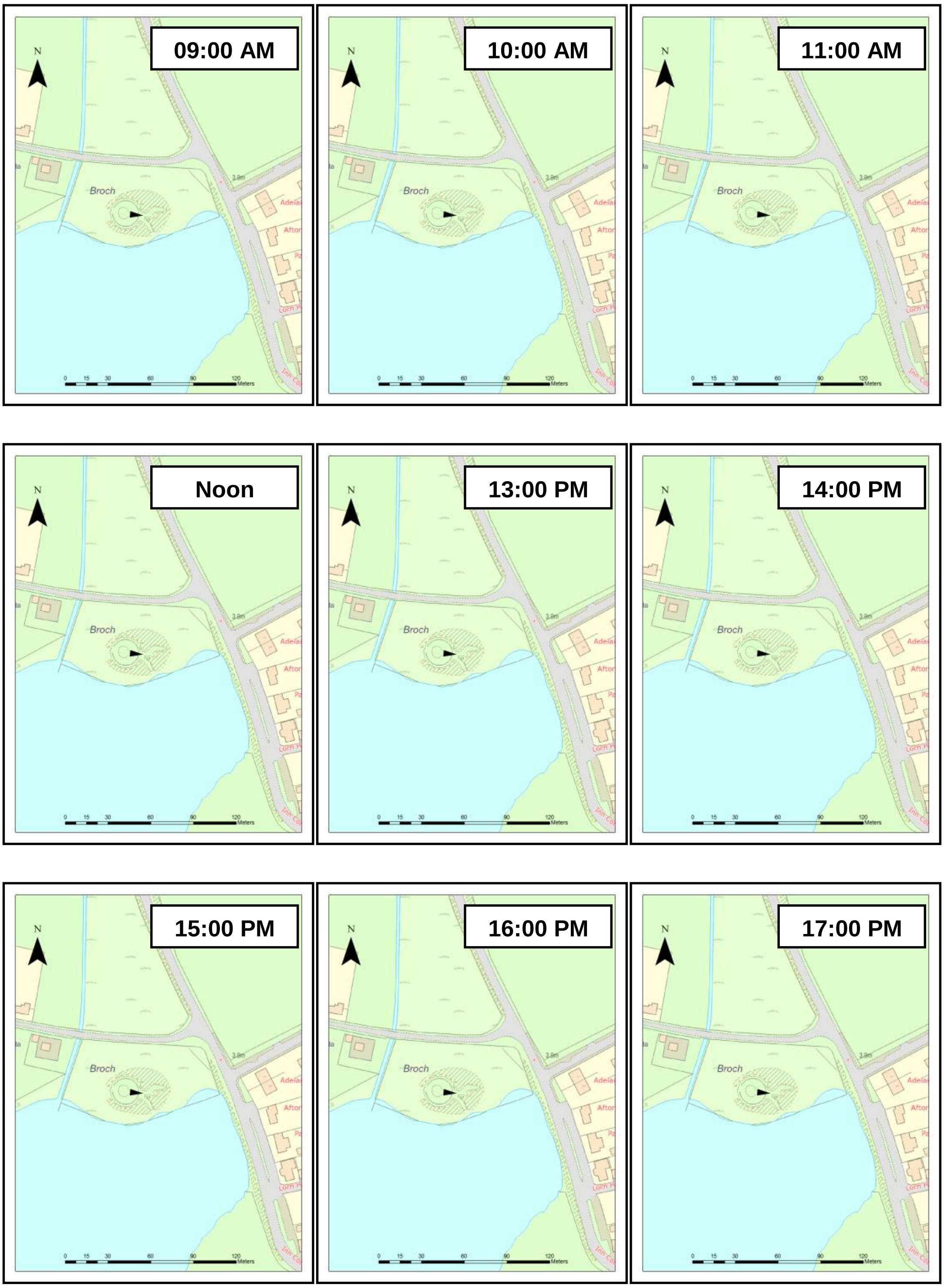
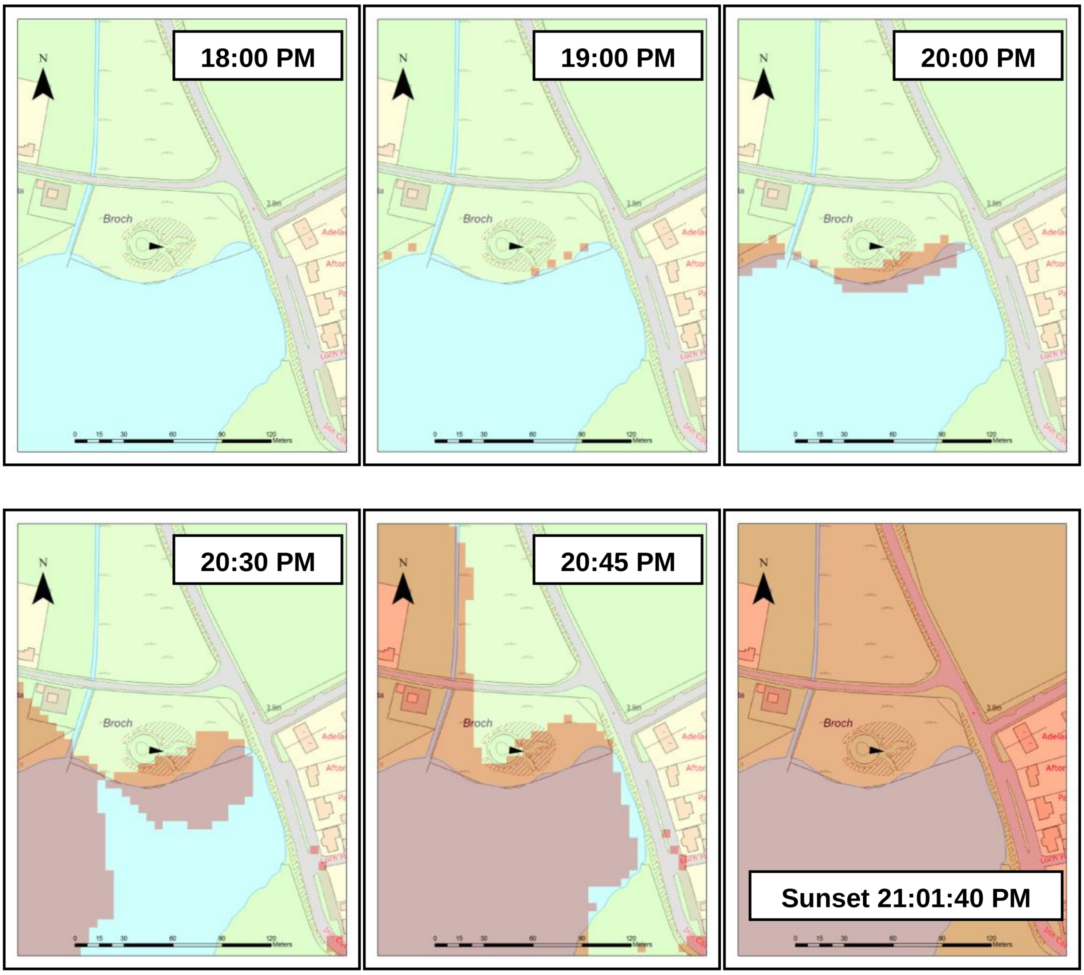


Figure 5.320. 18:00 PM to Sunset (21:01:40 PM) around Loch of Ayre on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 8: Howe of Hoxa

Canmore ID: 9612

Entrance: ESE

The Broch and its Landscape Context

This broch (Figure 5.321 and 5.322), cleared by Petrie in 1848 (RCAHMS 1946: 283-284; see also: Principal 1792; Wilson and Moore 1997), has extensive views over almost the entirety of Scapa Flow (Figure 5.323), while also possessing views of all the eastern entrances into this bay. It also possesses views of many other brochs, such as the Hillock of Brekna, Lingro, Loch of Ayre, Warebeth Cemetery and Breckness. This visibility, especially with regards to the sea, is doubtless key to understanding the site's position in the landscape, high up overlooking Scapa Flow.

The Winter Solstice – Figures 5.324 and 5.325

The broch gains direct light about half an hour after sunrise, and it and most of its immediate landscape retain it for the rest of the day, until sunset itself. It would have thus been obvious here that an entrance to the west or south-west would have been more beneficial here than it's ESE doorway with regards to direct light.

The Equinox (21st March) – Figures 5.326 and 5.327

Again, the broch gains direct light within half an hour after sunrise. But it retains it until only the last fifteen minutes before sunset. Nevertheless, a western entrance would have again been more suitable.

The Summer Solstice (21st June) Figures 5.328, 5.329 and 5.330

Howe of Hoxa gains light within a few minutes after the sun has risen, and it and its landscape retain it for the day, until just after 20:45 PM, probably about ten minutes before sunset. An eastern entrance would have thus gained slightly more light at this time of year.

Conclusions

The western side of this broch would have gained noticeably more direct light throughout much of the year, especially during winter, and so its ESE entrance is not quite as suitable as a WSW entrance would have been.

Figure 5.321. Howe of Hoxa, South Ronaldsay.
Author’s Photo.

Figure 5.322. Ground Plan of Howe of Hoxa.
(Crown Copyright: RCAHMS).

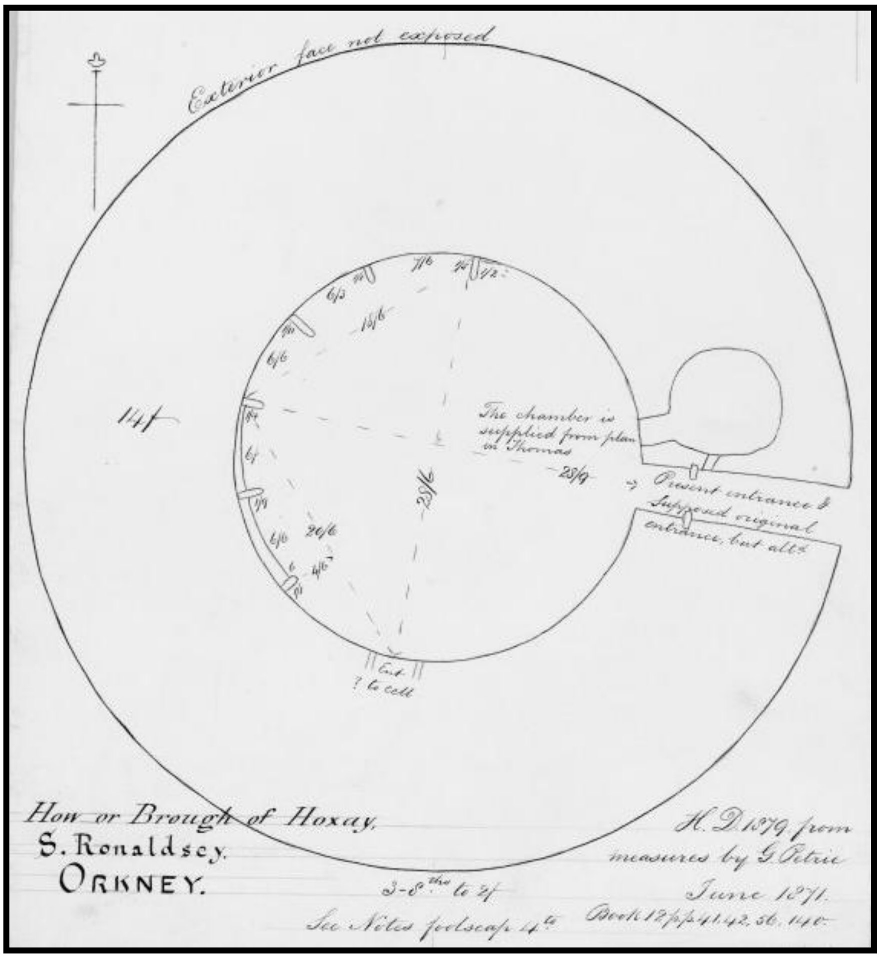


Figure 5.323. Multiple Viewsheds of Howe of Hoxa

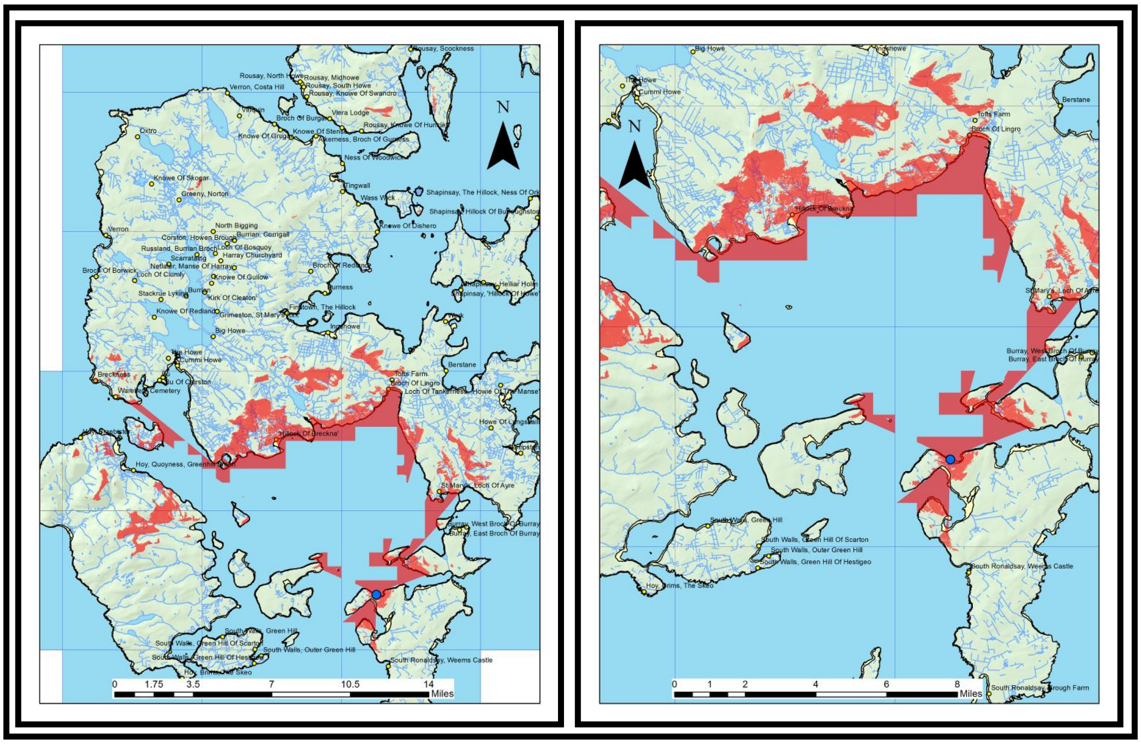


Figure 5.324. Sunrise (08:44 AM) to 13:30 PM around Howe of Hoxa on the Winter Solstice (21st December). Red areas denote areas of shadow.

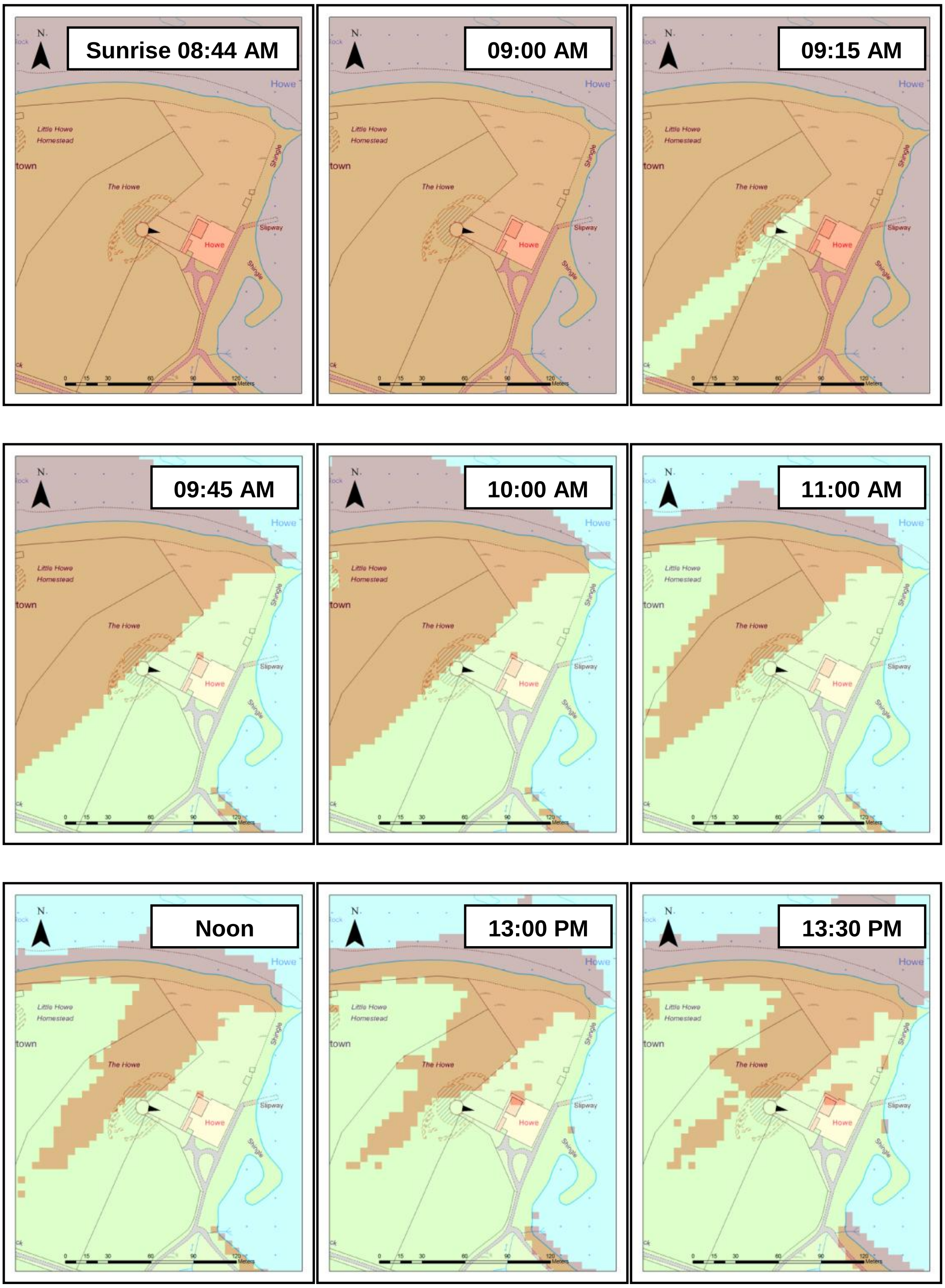


Figure 5.325. 14:00 PM to Sunset (14:47 PM) around Howe of Hoxa on the Winter Solstice (21st December). Red areas denote areas of shadow.

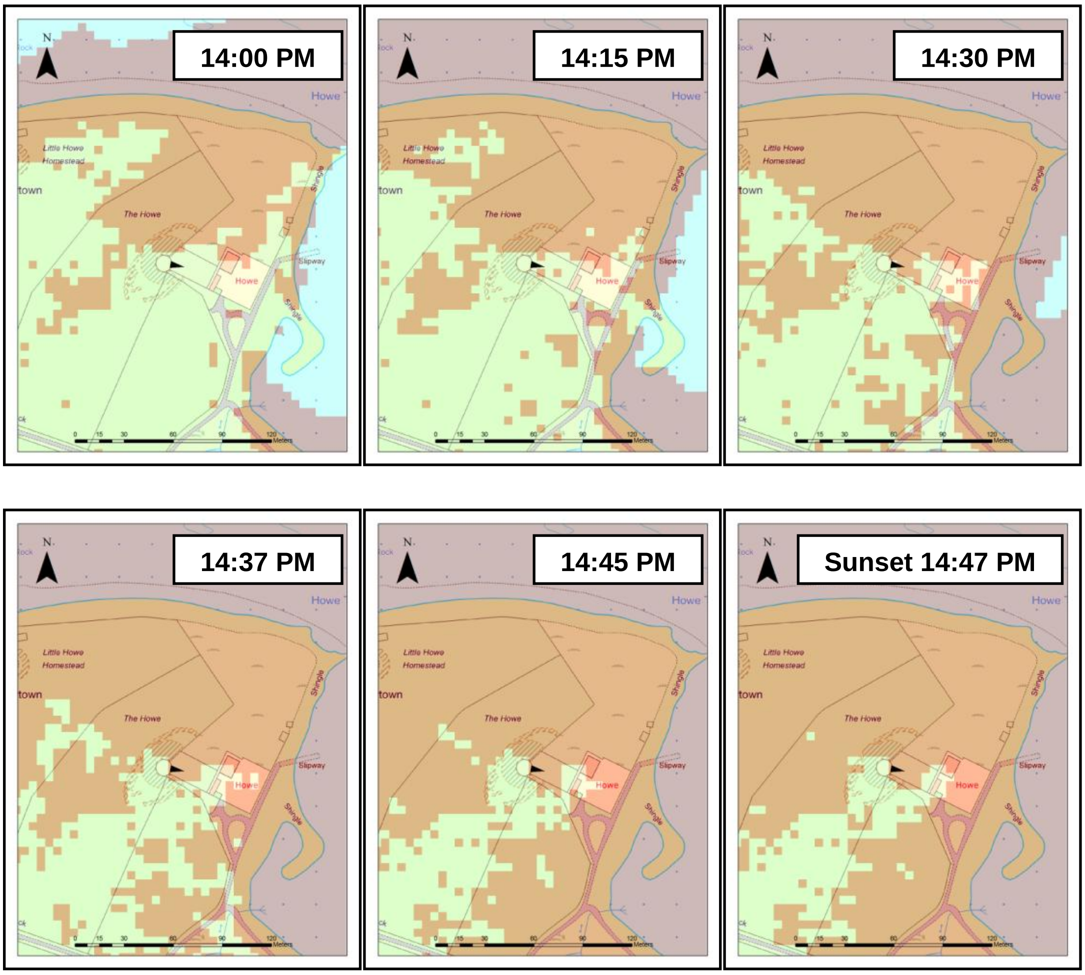


Figure 5.326. Sunrise (05:48 AM) to 11:00 AM around Howe of Hoxa on the Spring Equinox (21st March). Red areas denote areas of shadow.

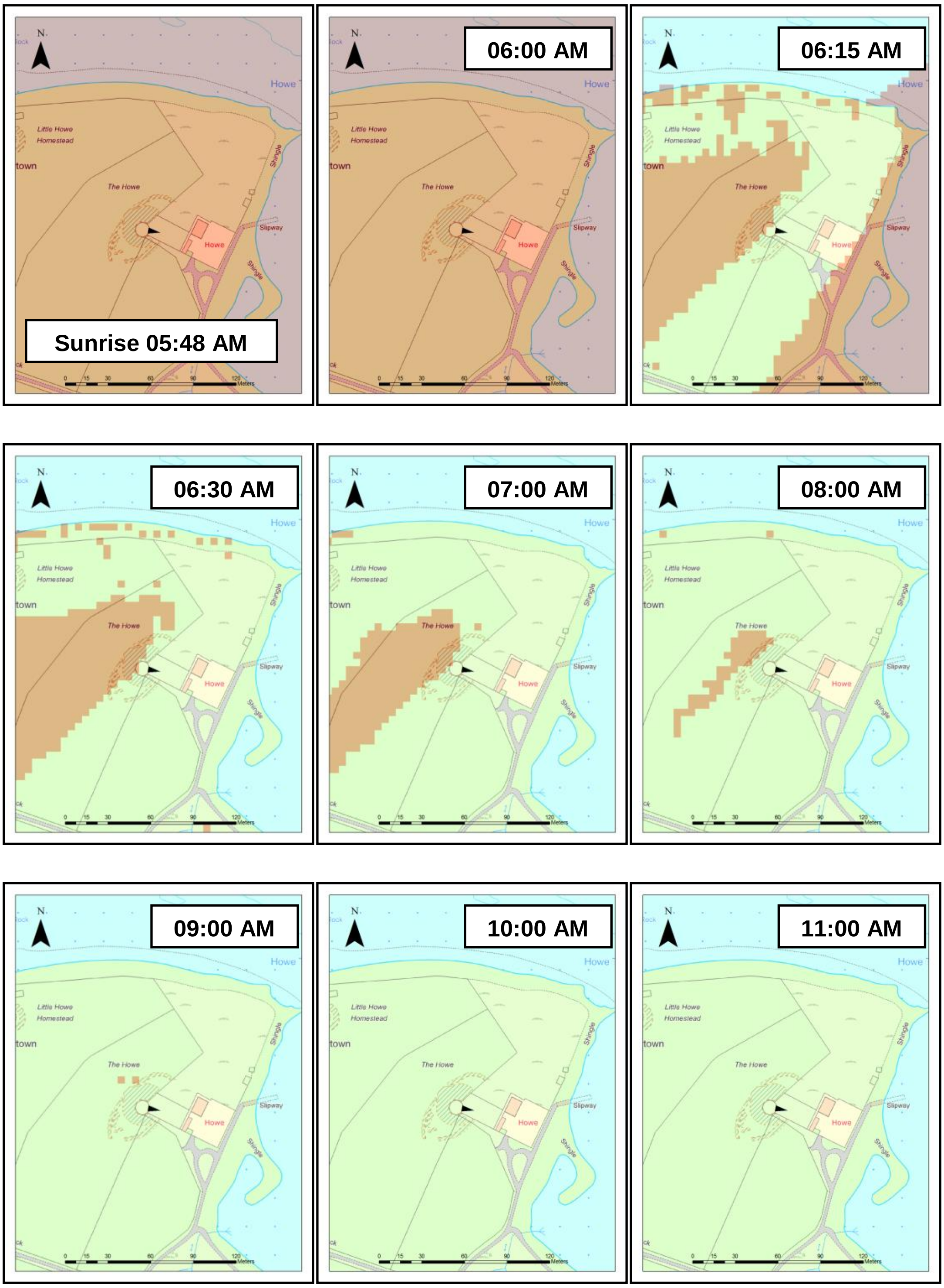


Figure 5.327. Noon to Sunset (18:02:15 PM) around Howe of Hoxa on the Spring Equinox (21st March). Red areas denote areas of shadow.

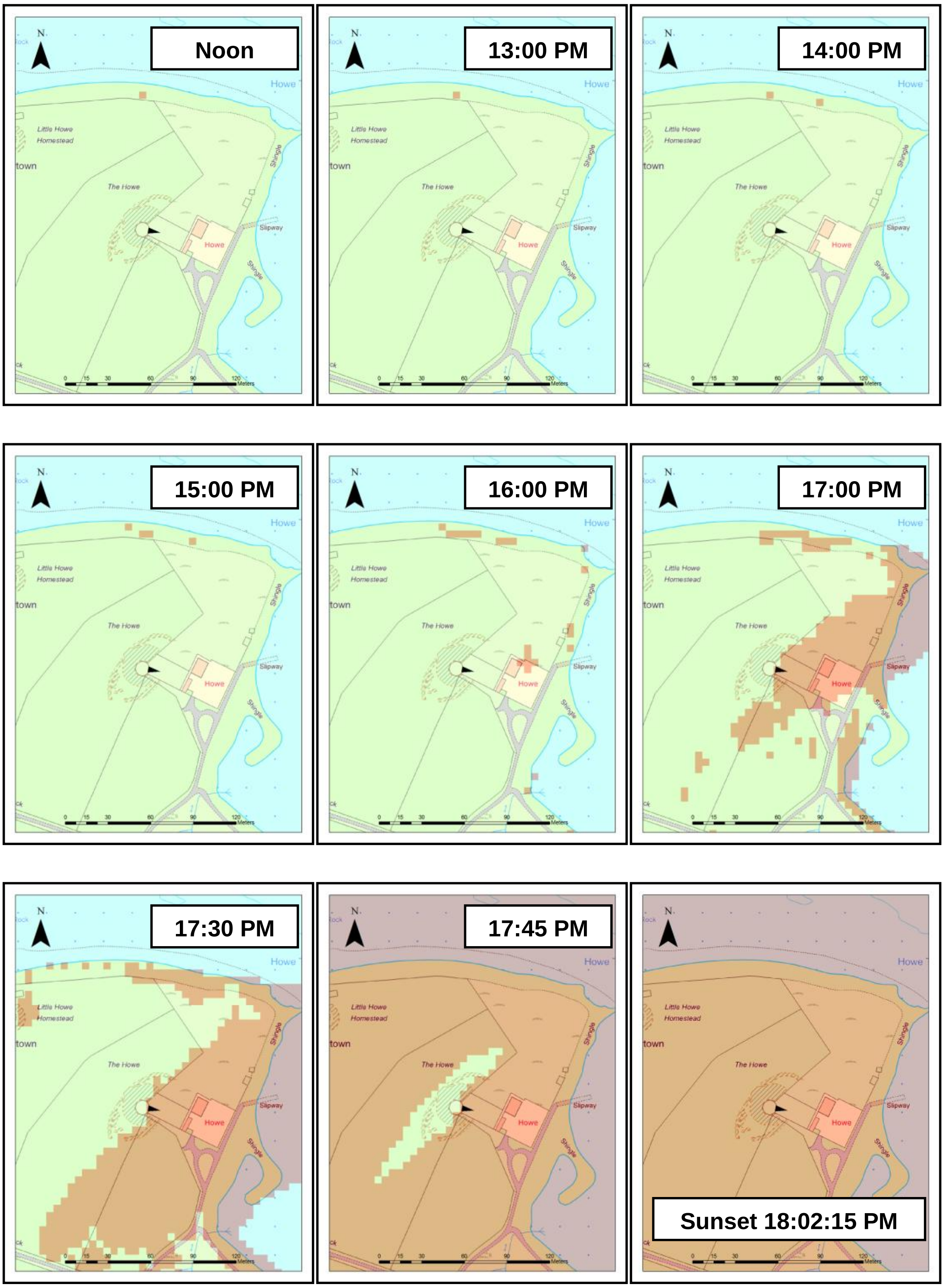


Figure 5.328. Sunrise (02:36:40 AM) to 08:00 AM around Howe of Hoxa on the Summer Solstice (21st June). Red areas denote areas of shadow.

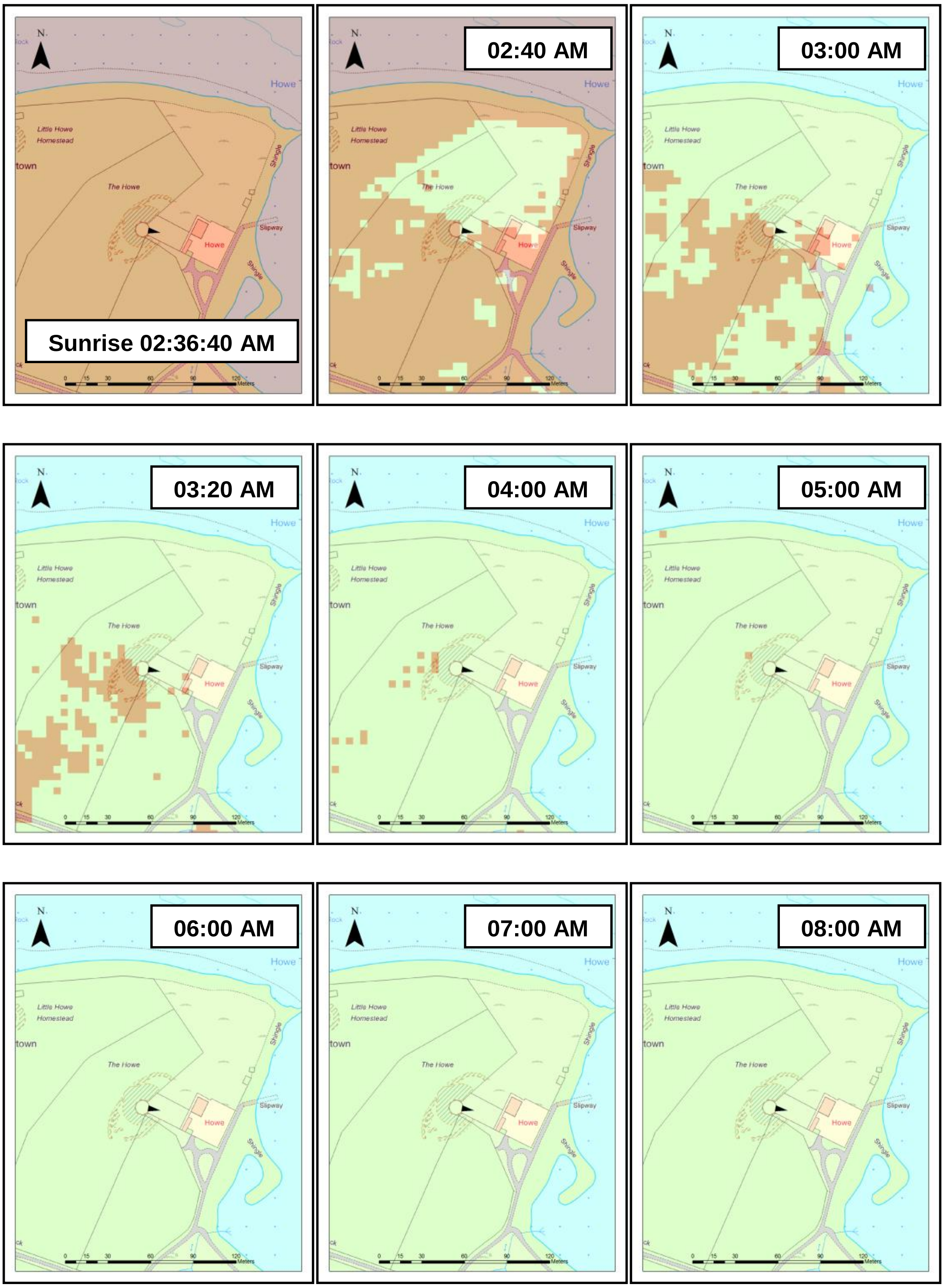


Figure 5.329. 09:00 AM to 17:00 PM around Howe of Hoxa on the Summer Solstice (21st June). Red areas denote areas of shadow.

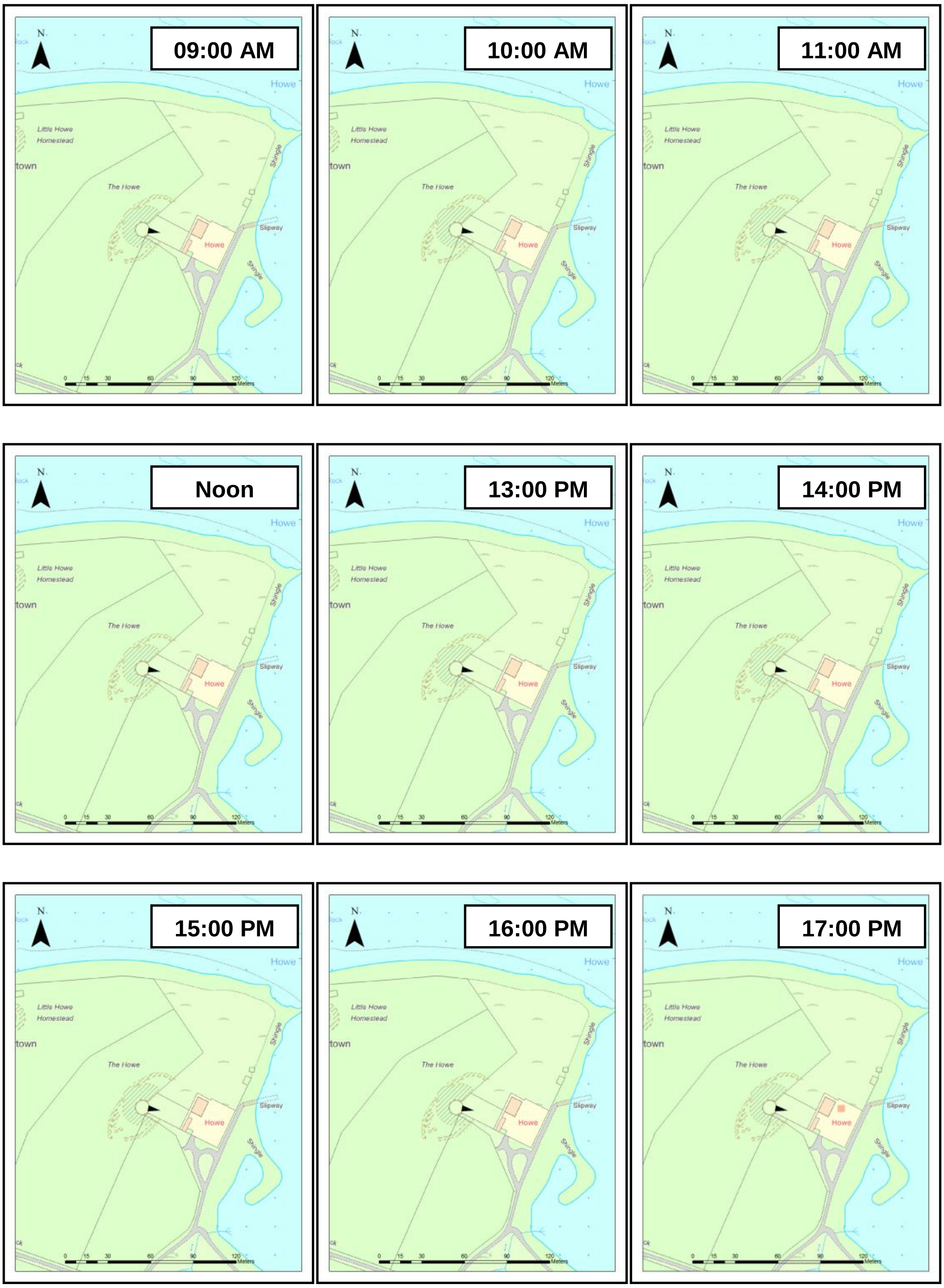
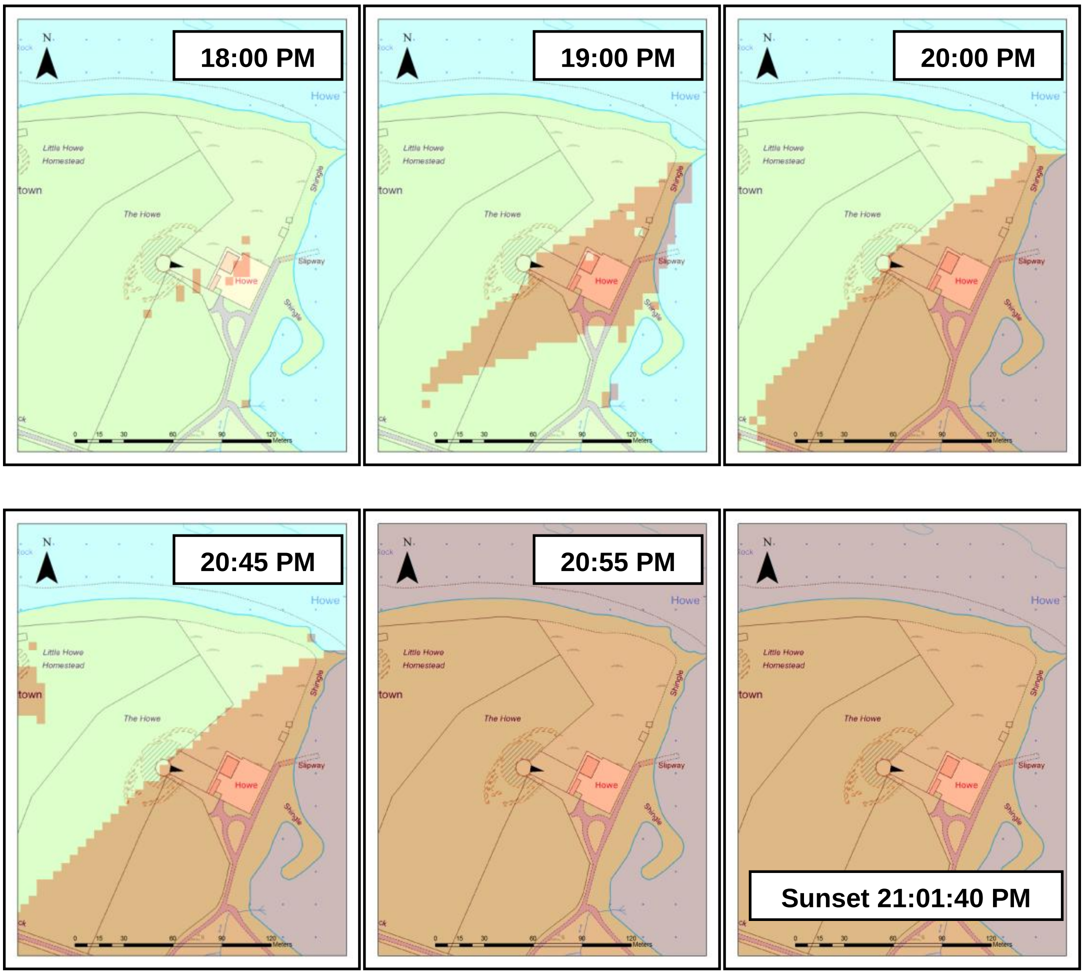


Figure 5.330.18:00 PM to Sunset (21:01:40 PM) around Howe of Hoxa on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 9: Scockness

Canmore ID: 2738

Entrance: SE

The Broch and its Landscape Context

Partially excavated in 1857 (Louttit 1921; RCAHMS 1946: 200), this broch stands on the NW shore of the Loch of Scockness (Figures 5.331 and 5.332), a freshwater loch separated from the sea by a storm beach. Tough possessing limited views of Rousay itself (Figure 5.333), due to the hills to the SW, Scockness has full views of the Westray Firth between Rousay, Westray and the island of Egilsay. As such it possesses views of the southern bays of Westray, as well as the brochs located there, such as Hodgalee and Tafts. It even has visibility of Papa Westray and North Ronaldsay, due to its position on the coast. Again, the sea was probably the object of attention.

The Winter Solstice – Figures 5.334 and 5.335

The broch gains direct light within fifteen minutes after sunrise, retaining it for the day until just after 14:00 PM, about forty-five minutes before sunset. Its SE entrance is thus the best possible for this time of year.

The Equinox (21st March) – Figures 5.336 and 5.337

Again, the broch gains direct light within fifteen minutes after sunrise, retaining it for the day until between 17:00 and 17:30 PM, between and hour and half-and hour before sunset. Its eastern entrance was thus suitable.

The Summer Solstice (21st June) Figures 5.338, 5.339 and 5.340

The broch gains direct light within a few minutes after sunrise, retaining it for the day, until probably around 20:15 PM, when the landscape falls into shadow, approximately forty-five minutes before sunset.

Conclusions

Throughout the year, a western entrance would have lost direct light, but its SE facing doorway gains the most available throughout winter, and would have been equally beneficial throughout spring and summer too.

Figure 5.331. View towards Scockness Broch, Rousay.
Author’s Photo.

Figure 5.332. View towards Scockness Broch, Rousay.
Author’s Photo.

Figure 5.333. Multiple Viewsheds of Scockness Broch.

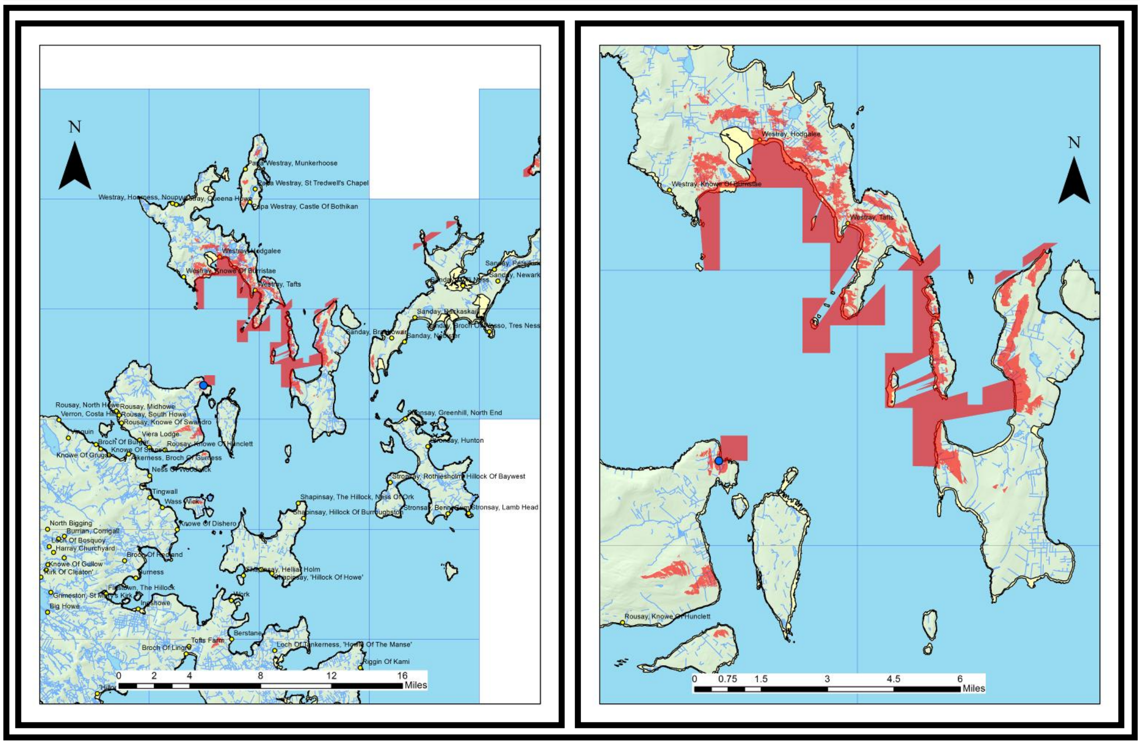


Figure 5.334. Sunrise (08:44 AM) to 13:00 PM around Scockness on the Winter Solstice (21st December). Red areas denote areas of shadow.

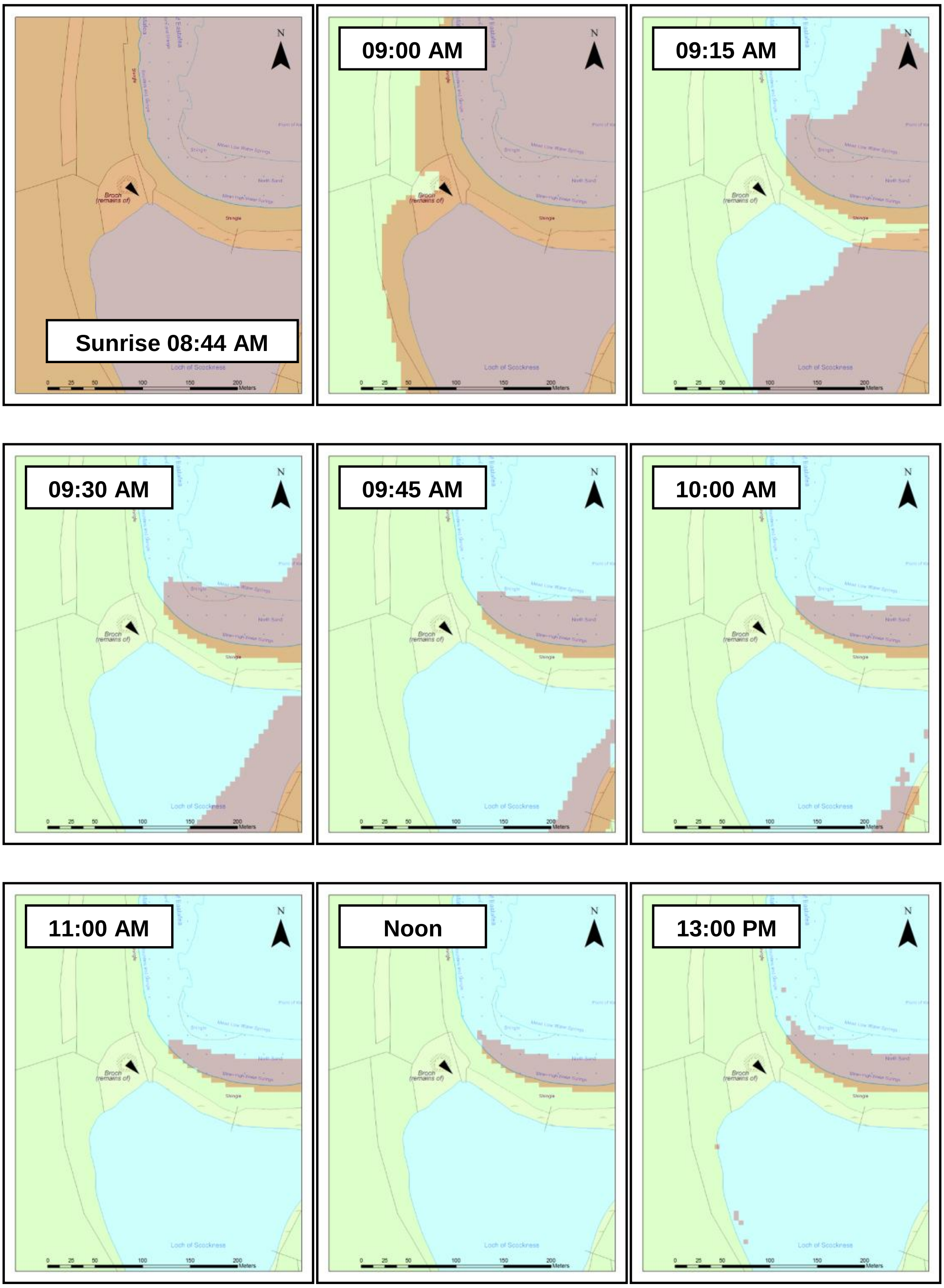


Figure 5.335. 13:30 PM to Sunset (14:47 PM) around Scockness on the Winter Solstice (21st December). Red areas denote areas of shadow.

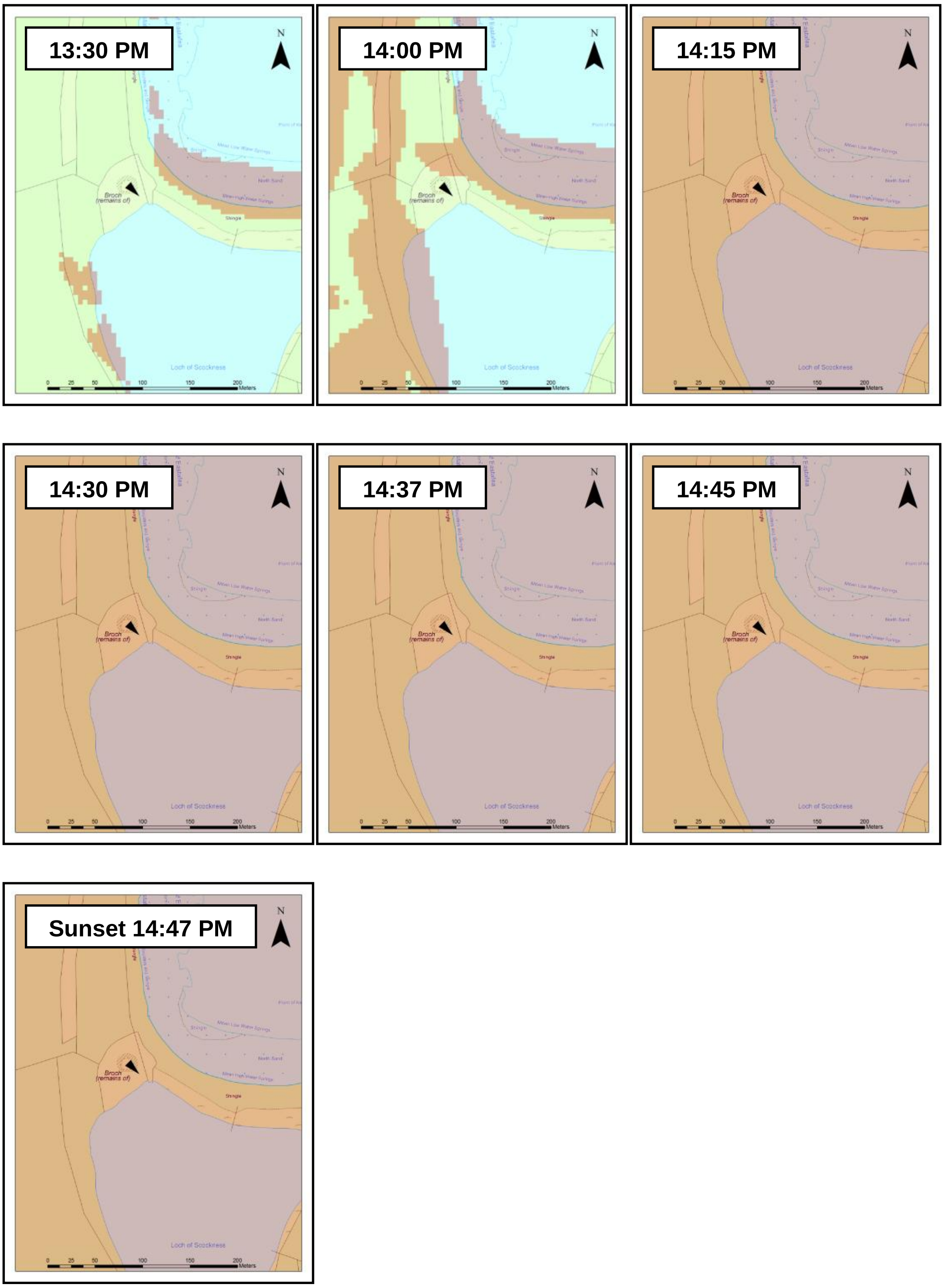


Figure 5.336. Sunrise (05:48 AM) to 11:00 AM around Scockness on the Spring Equinox (21st March). Red areas denote areas of shadow.

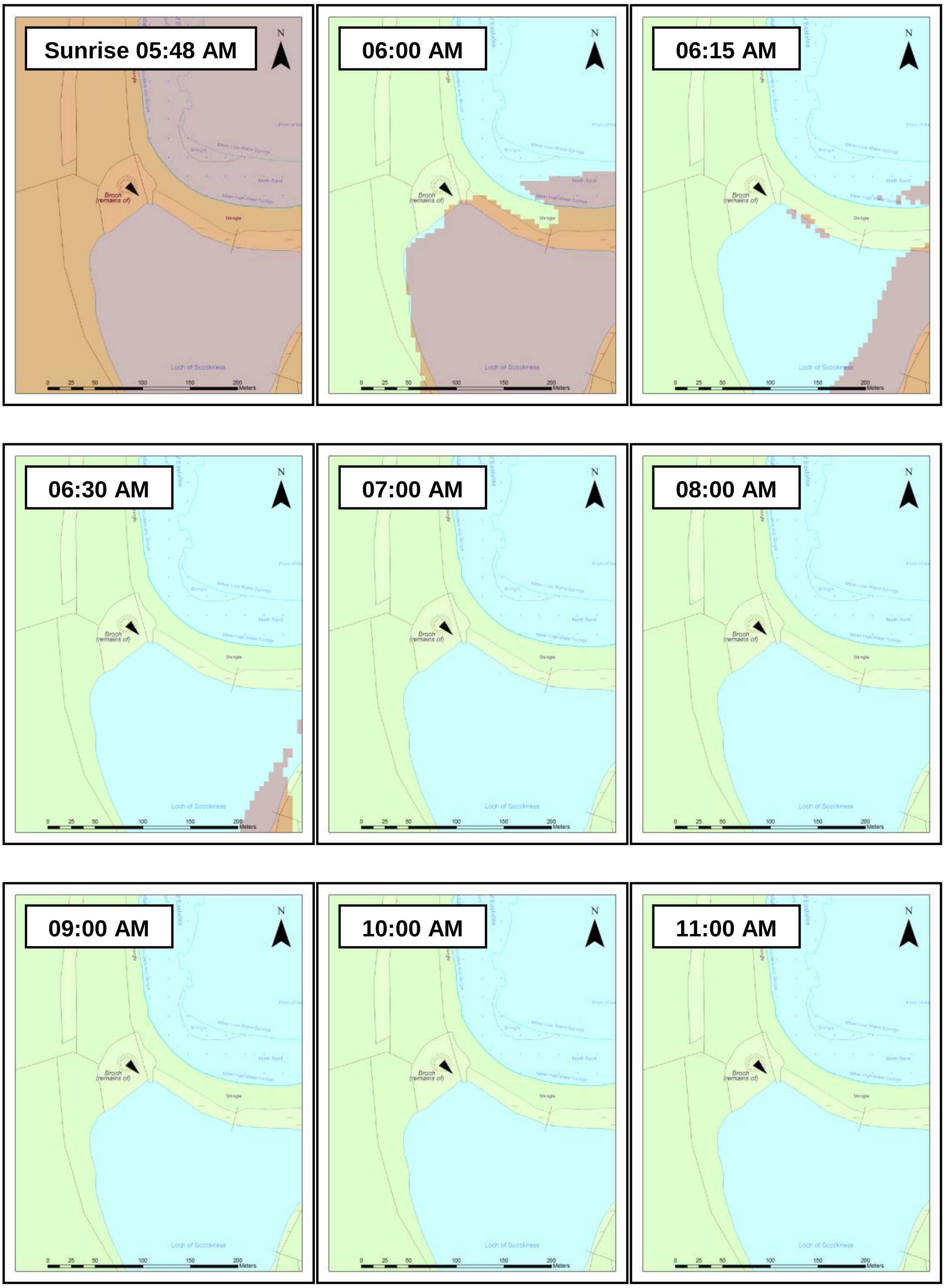


Figure 5.337. Noon to Sunset (18:02:15 PM) around Scockness on the Spring Equinox (21st March). Red areas denote areas of shadow.

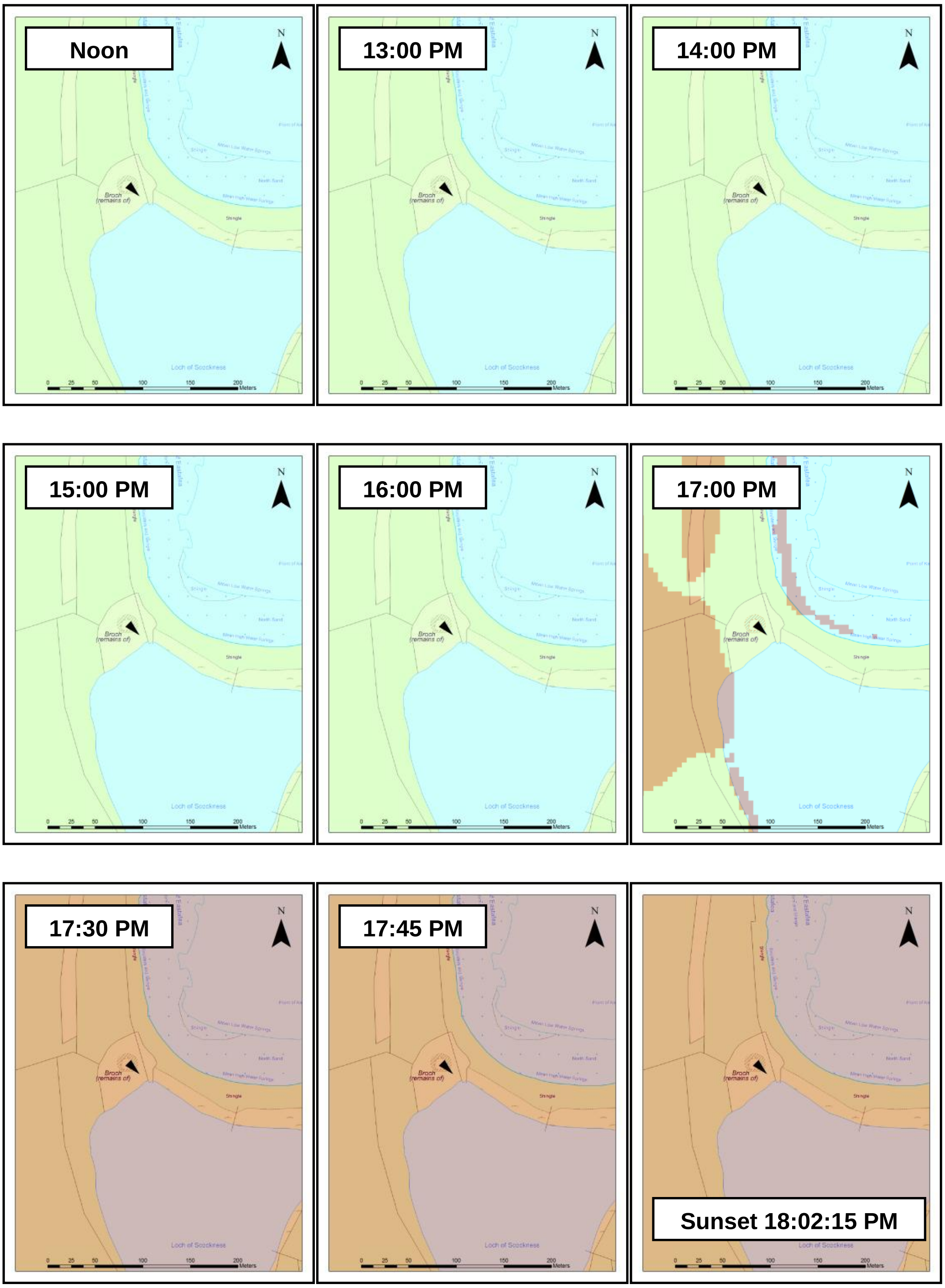


Figure 5.338. Sunrise (02:36:40 AM) to 09:00 AM around Scockness on the Summer Solstice (21st June). Red areas denote areas of shadow.

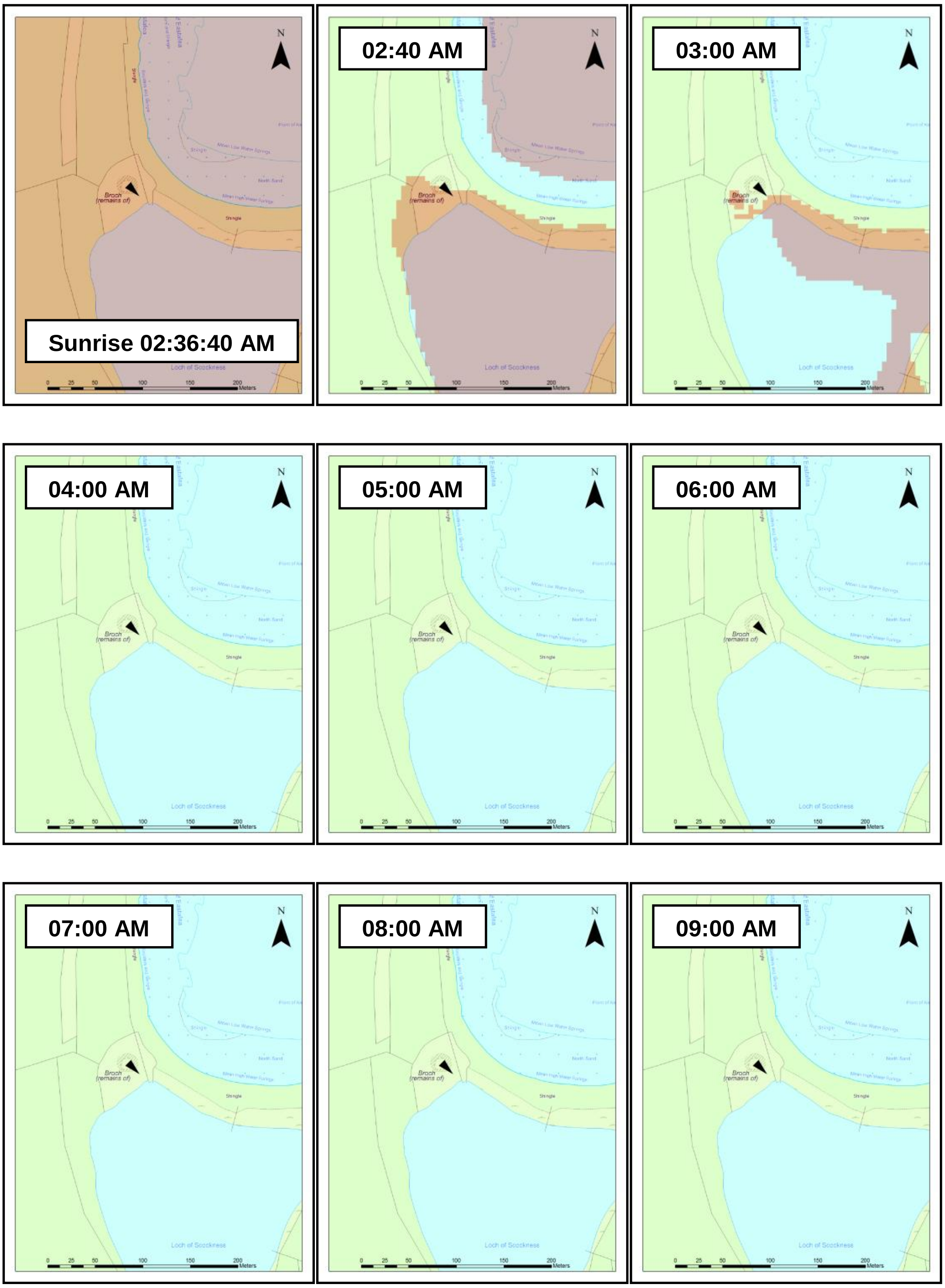


Figure 5.339. 10:00 AM to 18:00 PM around Scockness on the Summer Solstice (21st June). Red areas denote areas of shadow.

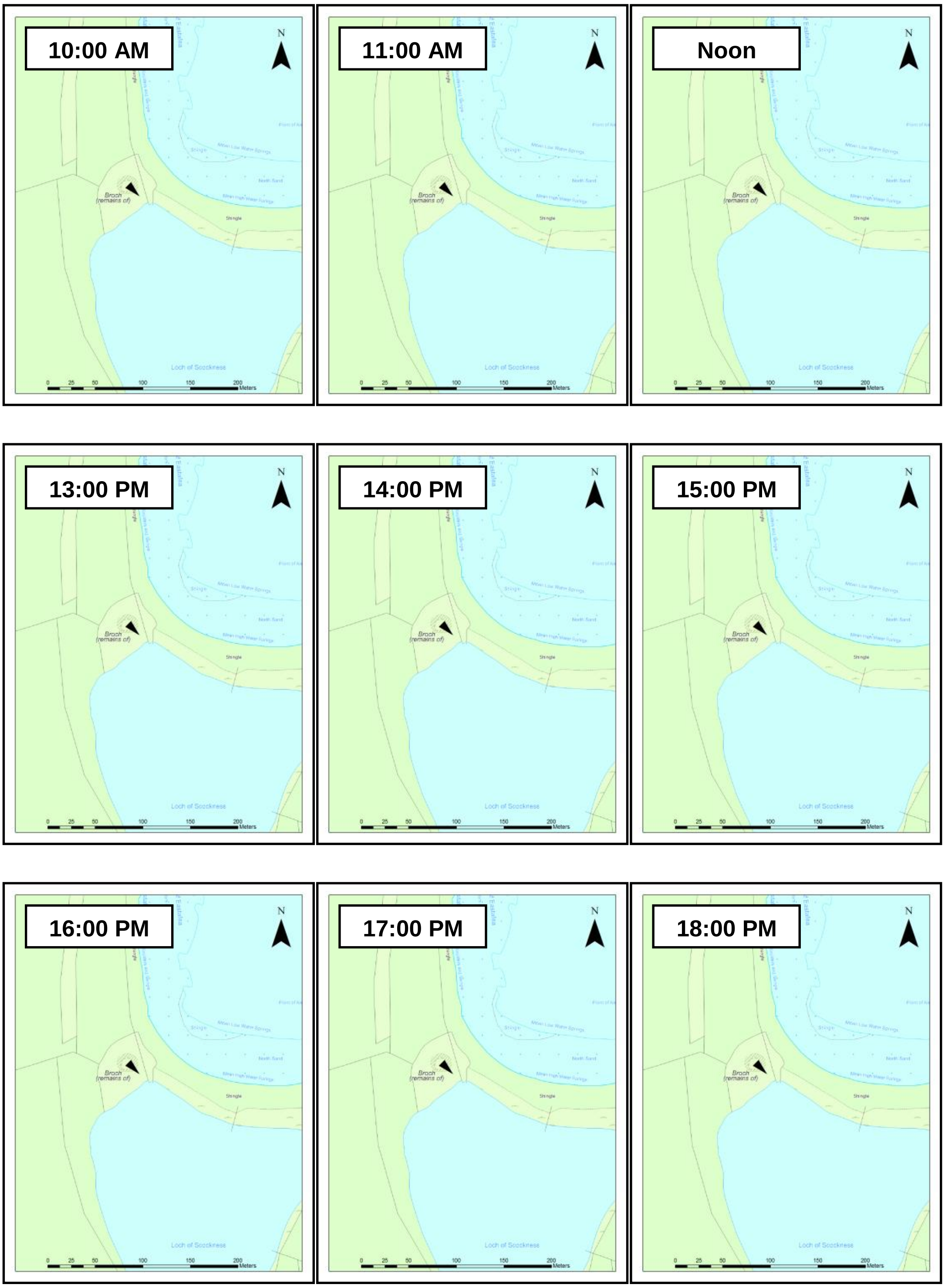
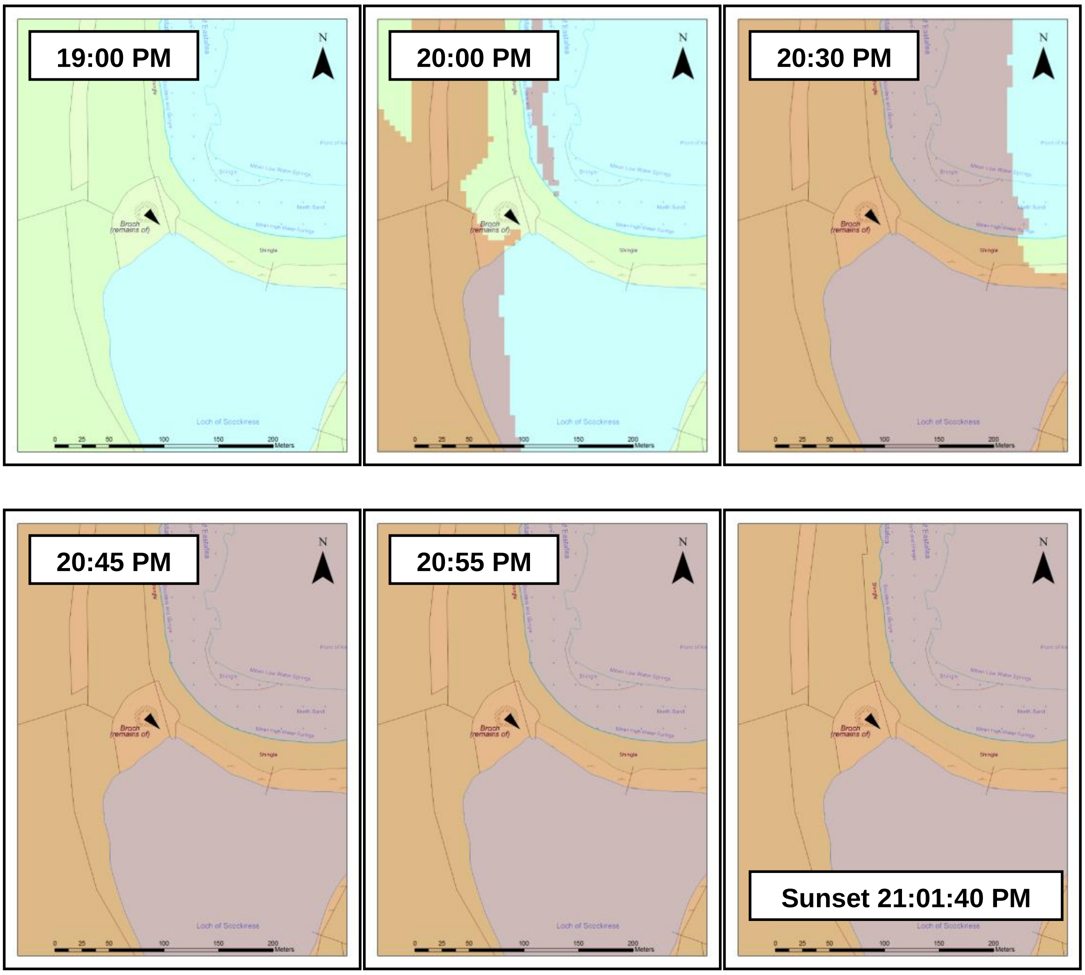


Figure 5.340. 19:00 PM to Sunset (21:01:40 PM) around Scockness on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 10: Broch of Lingro

Canmore ID: 2348

Entrance: SE

The Broch and its Landscape Context

Excavated in 1879 by Petrie (see Figure 5.341; RCAHMS 1946: 152-153; cf. Hedges 1987b: 81-83), it is obvious that the object of attention for this broch – located on flat ground near an accessible bay – was the sea, and in particular, Scapa Flow (Figure 5.342). It has good views over this particular stretch of water, looking over the entrances into the Sound to the north of South Ronaldsay and Burray, and with a view over just one other broch – Howe of Hoxa. Again, the sea was paramount to this site.

The Winter Solstice – Figures 5.343 and 5.344

The site gains direct light within the first half hour of the day, retaining it until around 14:45 PM, about half and hour before sunset. Its SE entrance would have gained the most amount of direct light possible, though an entrance to the SW would have roughly gained equal amounts, and so the morning light may have been more important here.

The Equinox (21st March) – Figures 5.345 and 5.346

Again, the site gains daylight half an hour after sunrise, retaining it for the day until approximately forty five minutes before sunset. The eastern entrance would thus have been more suitable than a western during this time of year.

The Summer Solstice (21st June) Figures 5.347, 5.348 and 5.349

During the summer, it takes approximately forty minutes for the site to gain direct sunlight, though it retains it for the day until probably just after 20:00 PM, between forty and forty-five minutes before sunset.

Conclusions

Throughout the year, this site gains good amounts of direct light, and the SE entrance was the most suitable possible.

Figure 5.341. Ground Plan of Broch of Lingro.
(After: MacKie 2002a: 332: fig. 5.112).

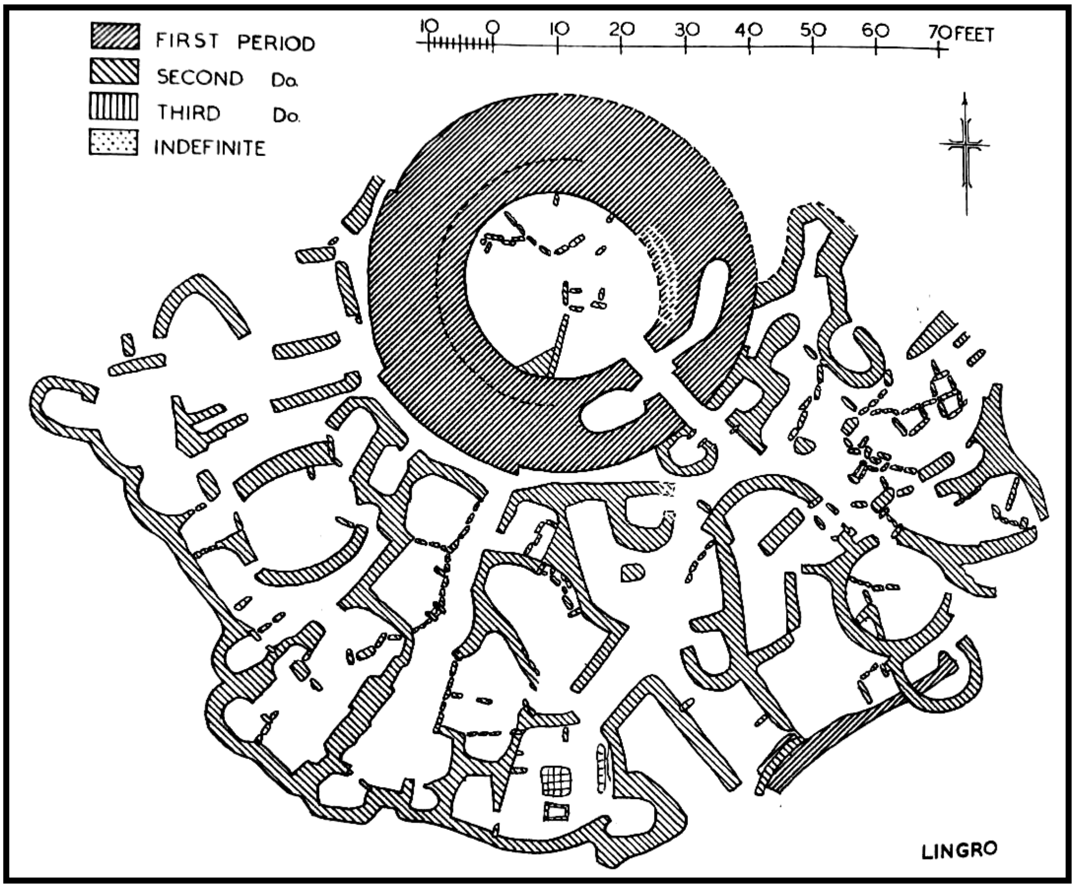


Figure 5.342. Multiple Viewsheds of Broch of Lingro.

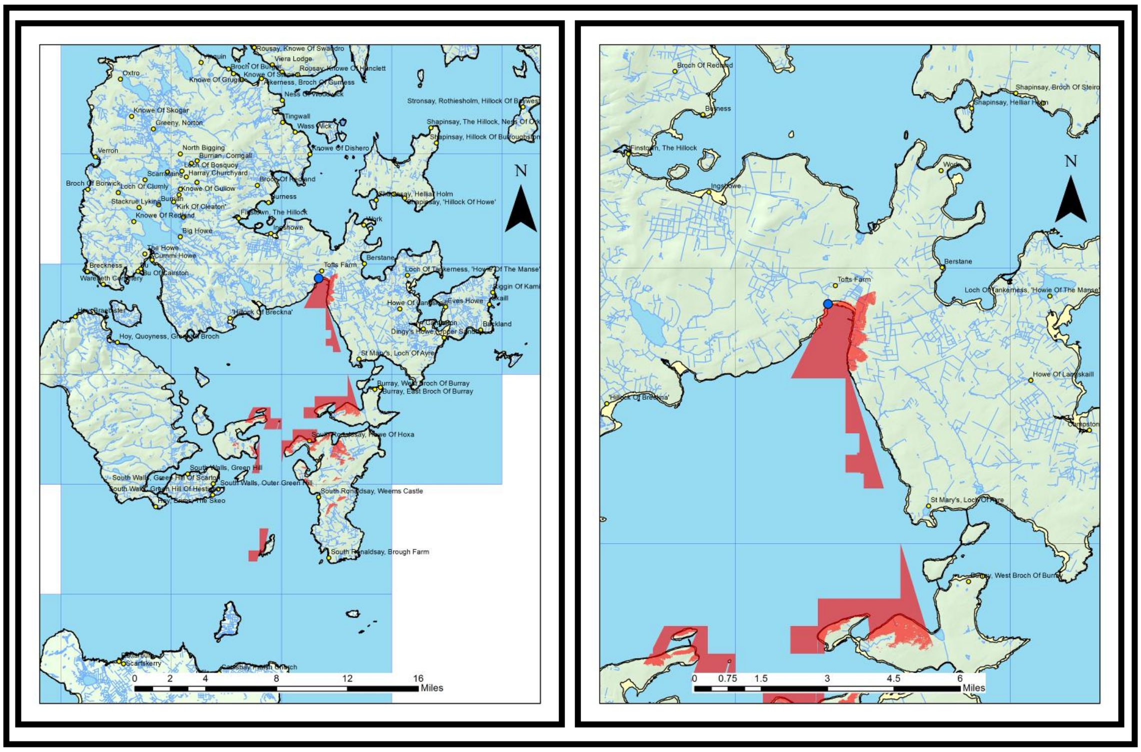


Figure 5.343. Sunrise (08:44 AM) to 13:00 PM around Broch of Lingro on the Winter Solstice (21st December). Red areas denote areas of shadow.

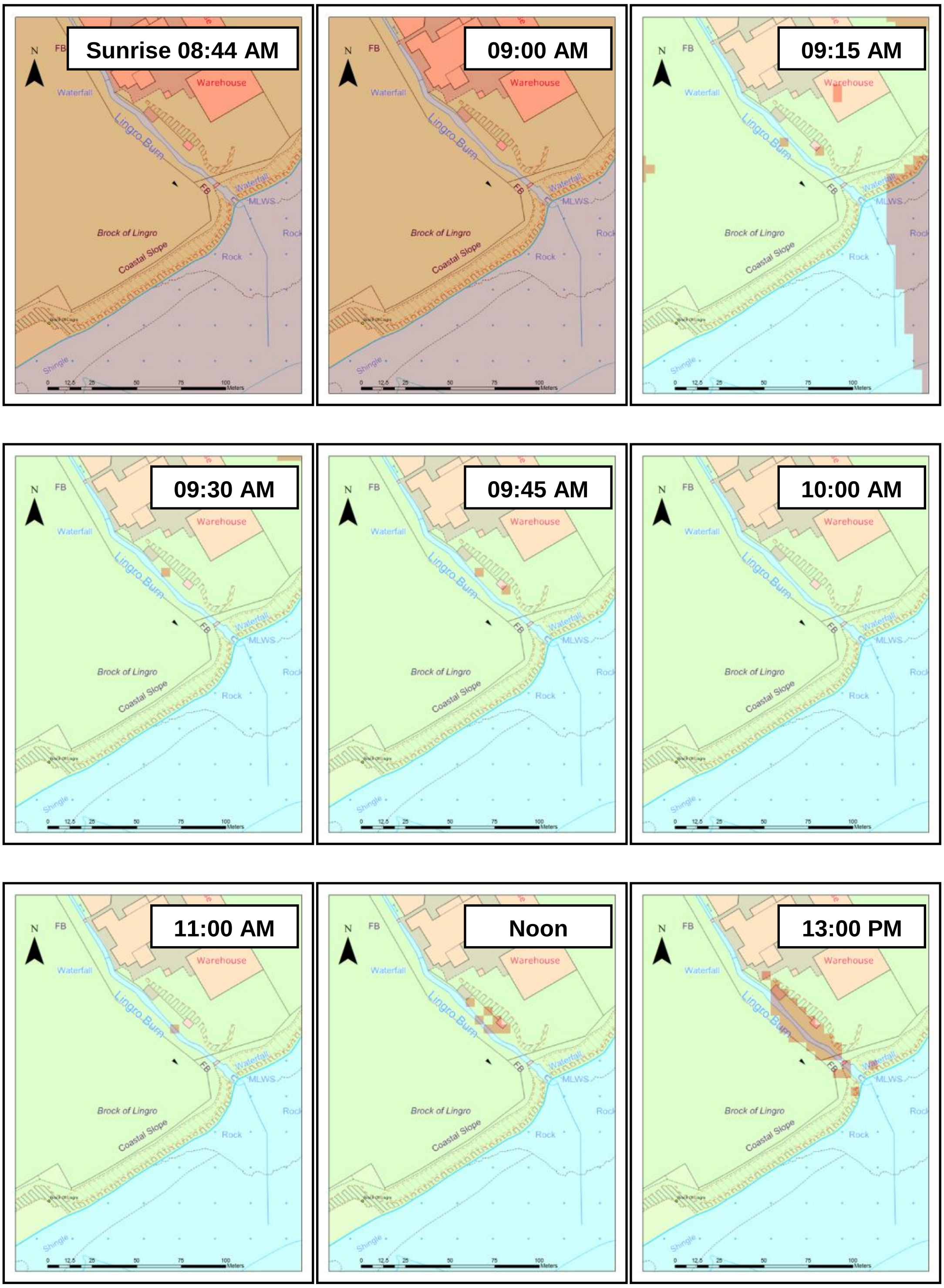


Figure 5.344. 13:30 PM to Sunset (14:47 PM) around Broch of Lingro on the Winter Solstice (21st December). Red areas denote areas of shadow.

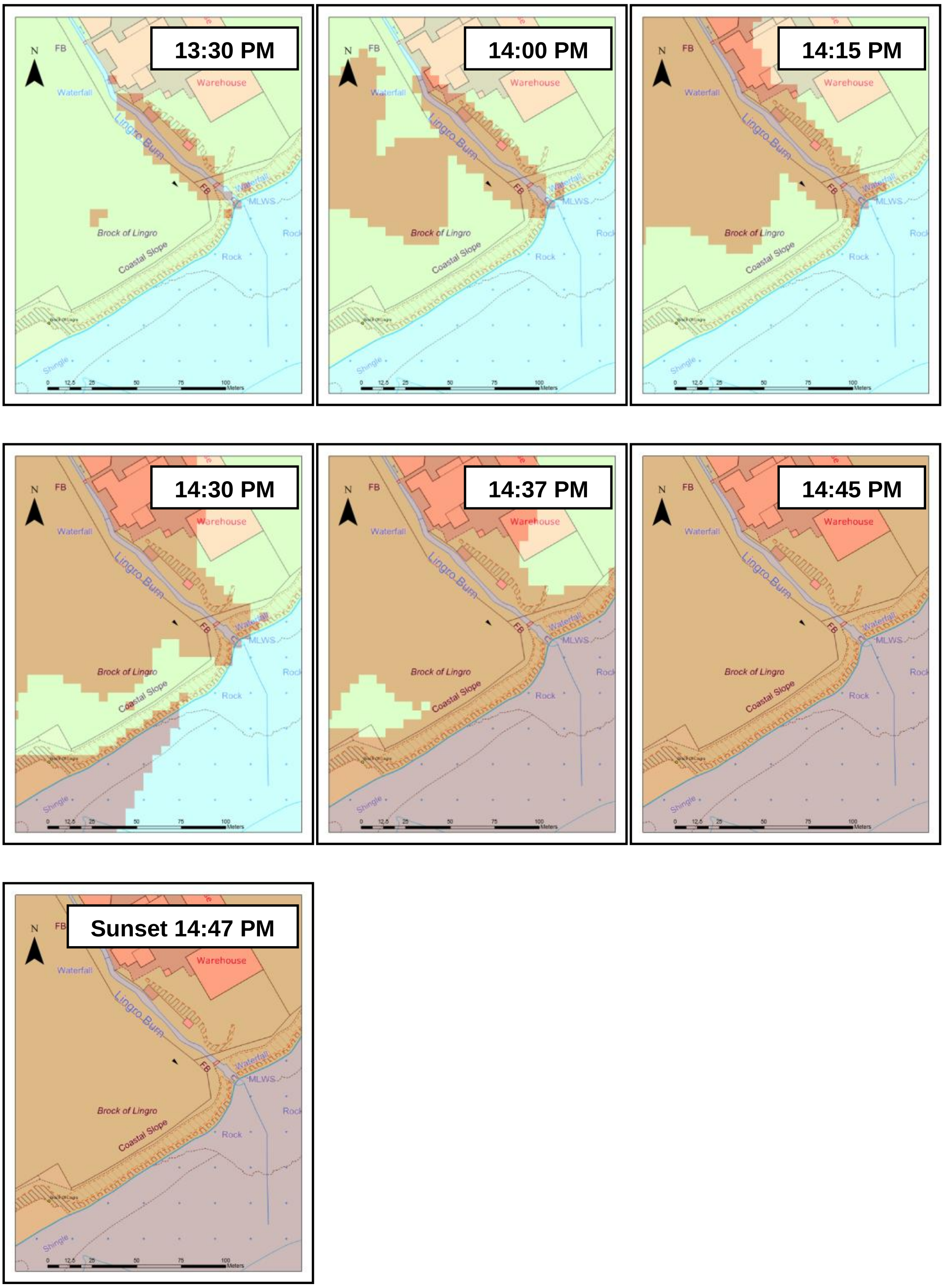


Figure 5.345. Sunrise (05:48 AM) to 11:00 AM around Broch of Lingro on the Spring Equinox (21st March). Red areas denote areas of shadow.

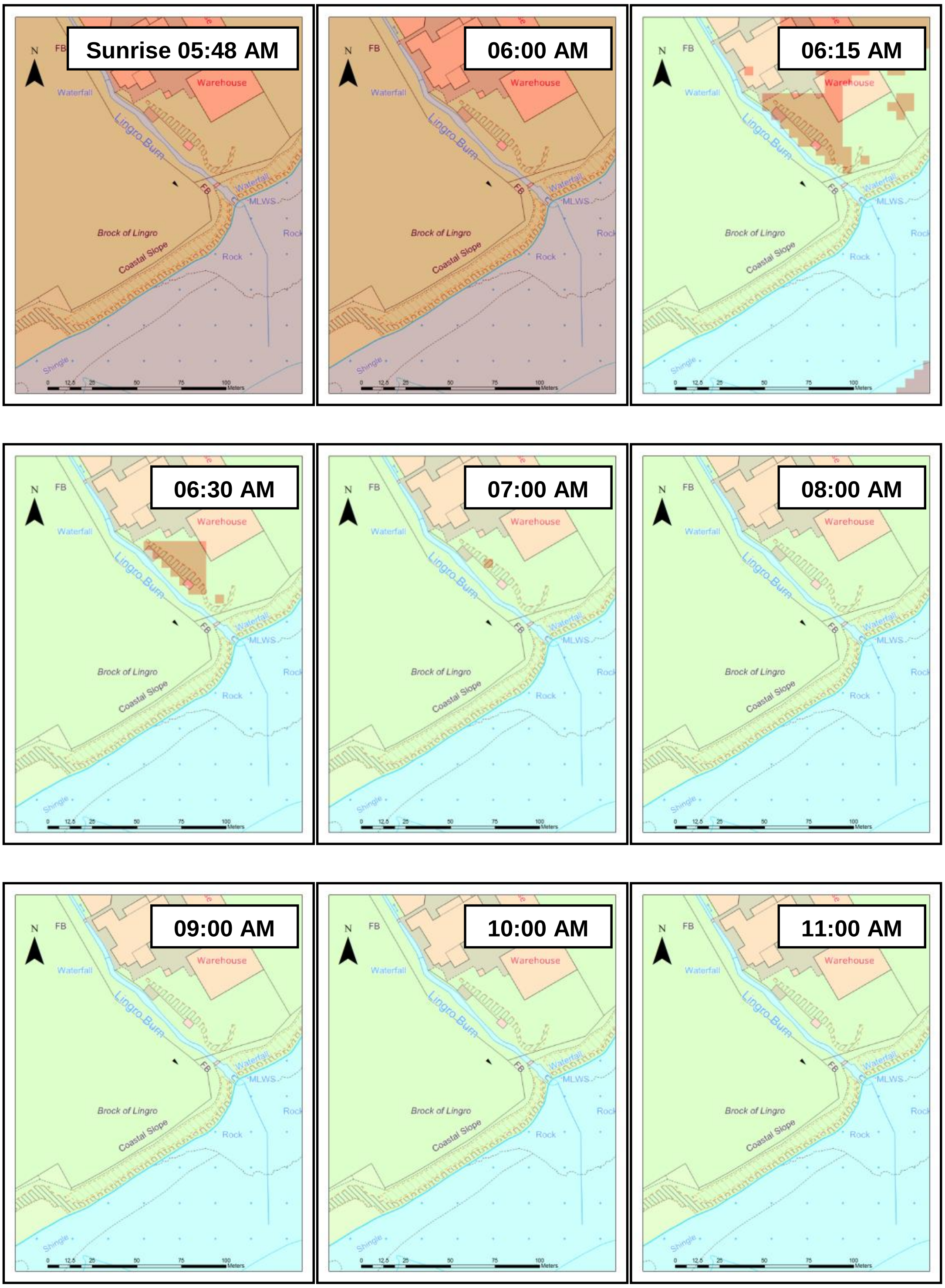


Figure 5.346. Noon to Sunset (18:02:15 PM) around Broch of Lingro on the Spring Equinox (21st March). Red areas denote areas of shadow.

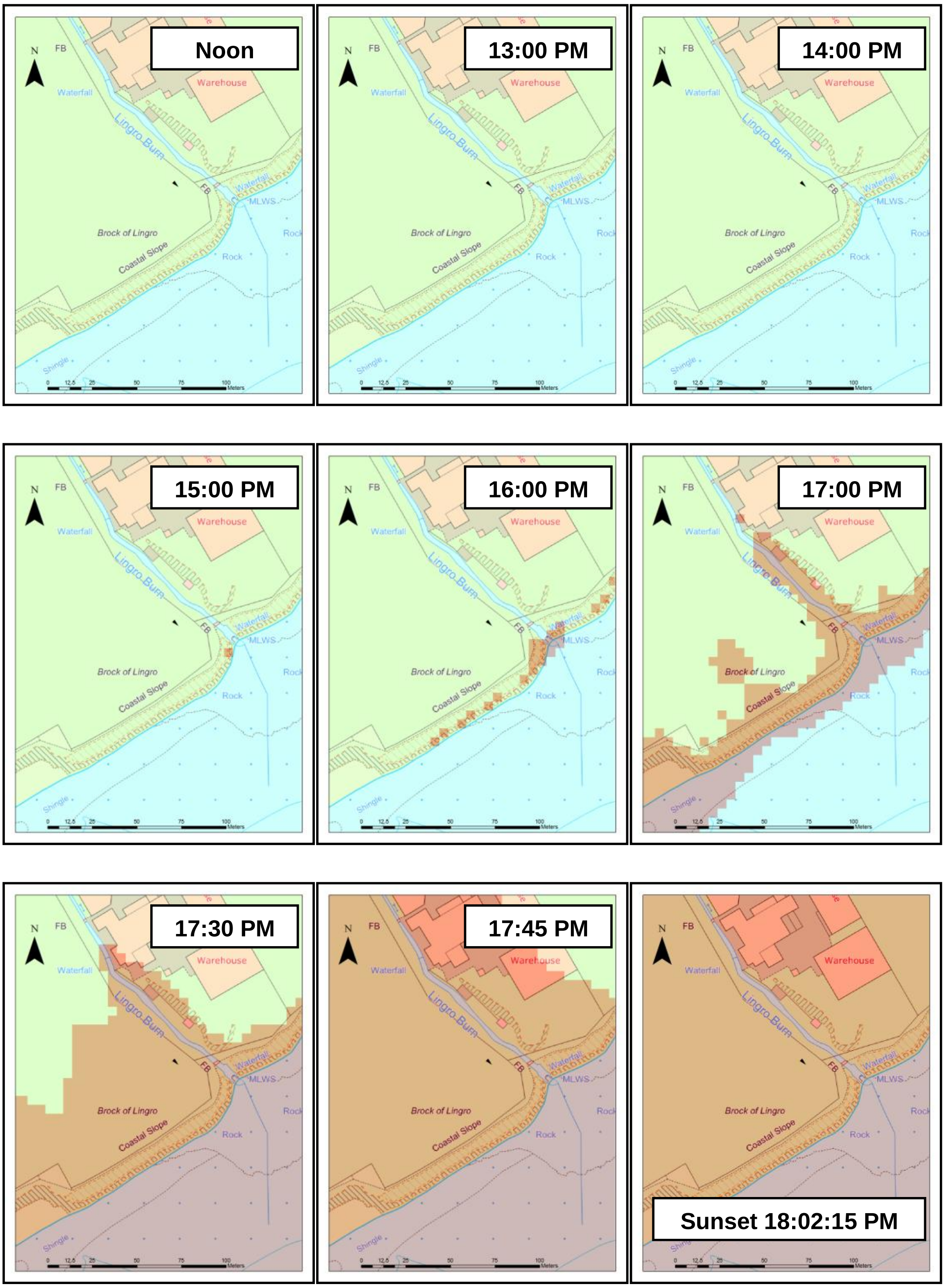


Figure 5.347. Sunrise (02:36:40 AM) to 08:00 AM around Broch of Lingro on the Summer Solstice (21st June). Red areas denote areas of shadow.

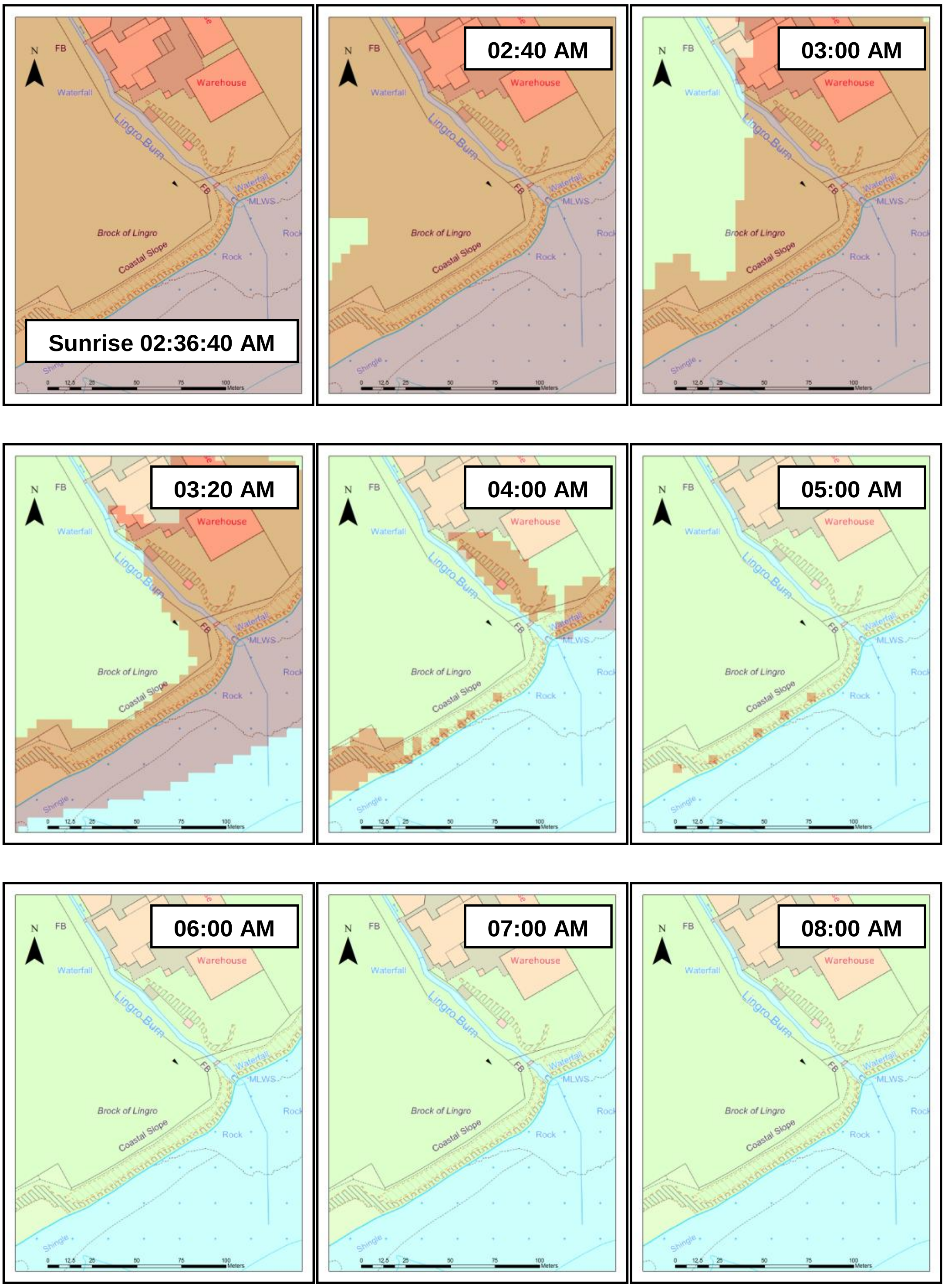


Figure 5.348. 09:00 AM to 17:00 PM around Broch of Lingro on the Summer Solstice (21st June). Red areas denote areas of shadow.

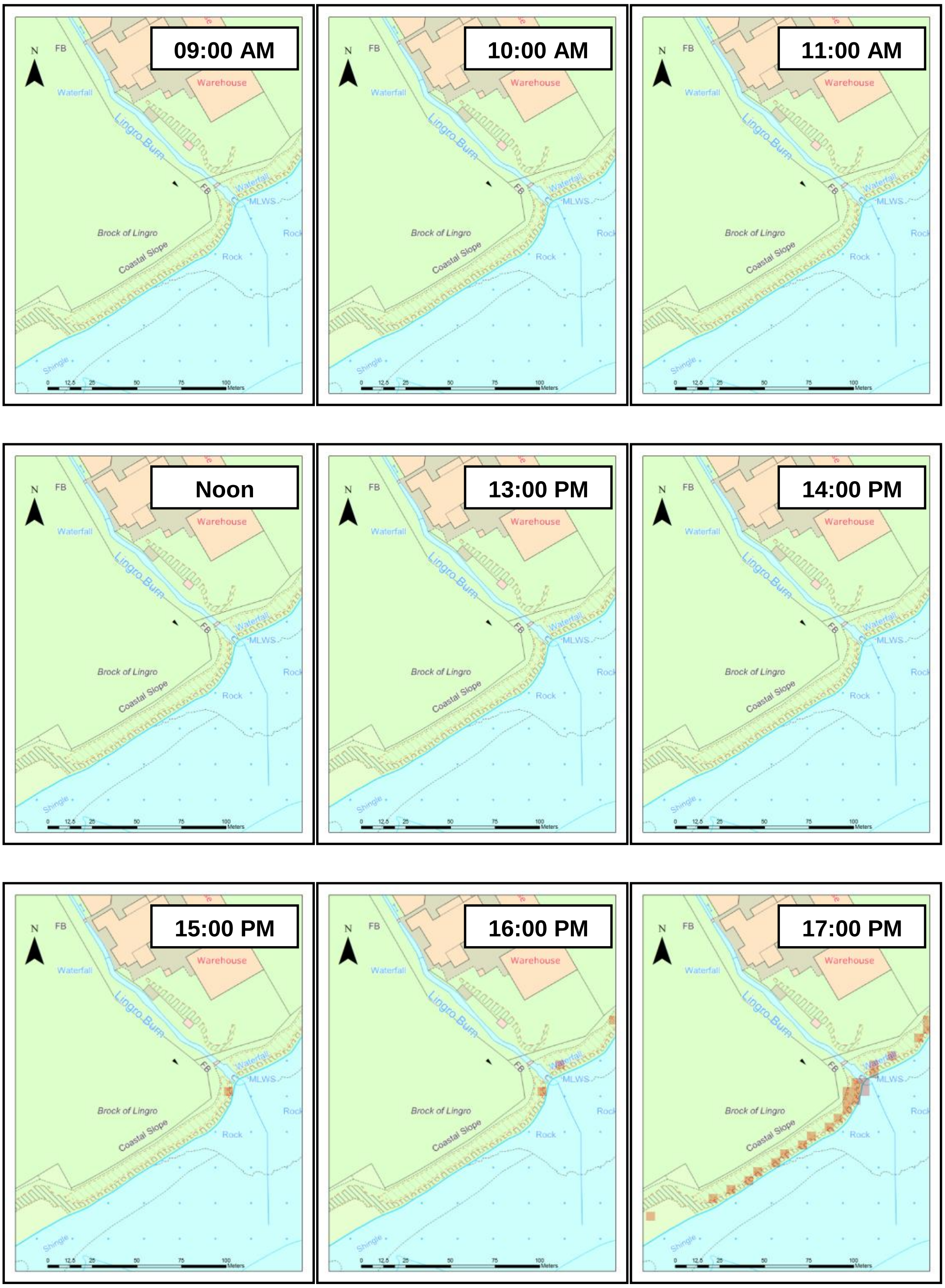
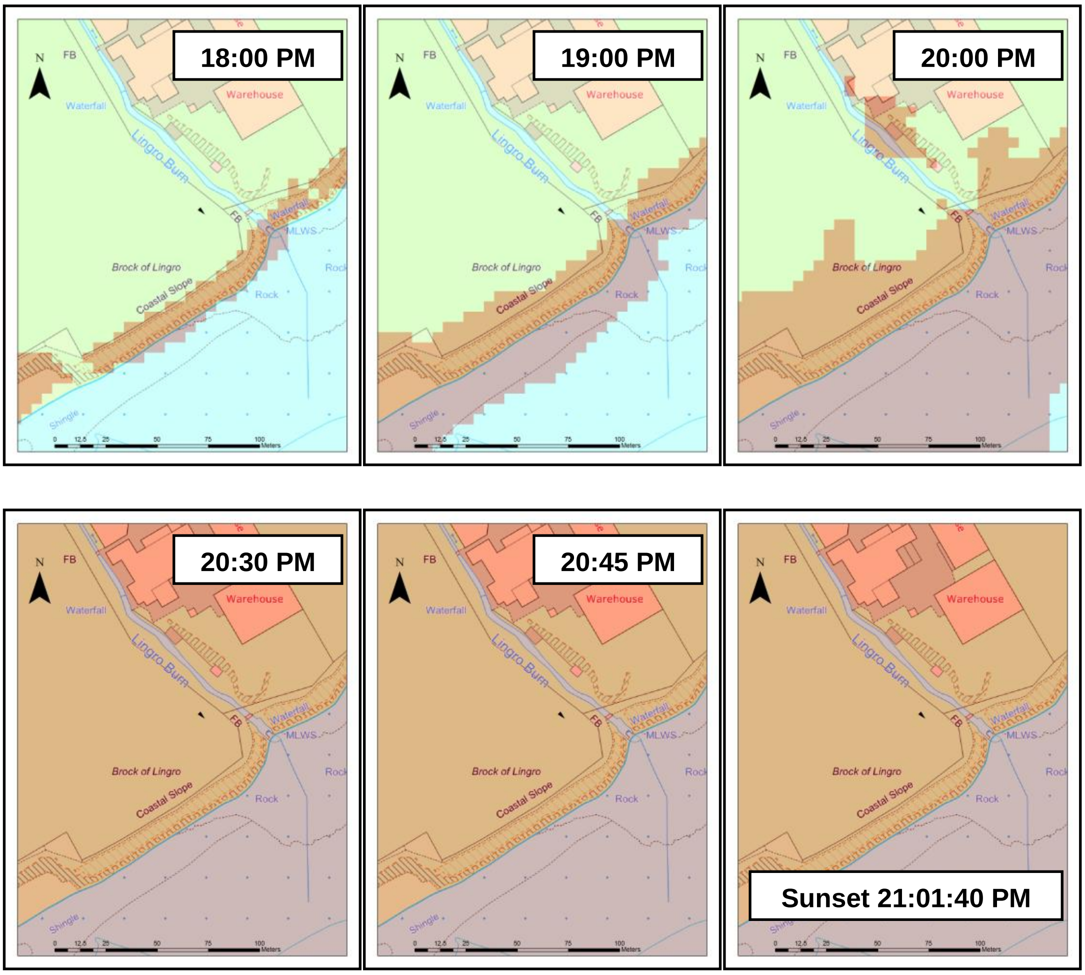


Figure 5.349. 18:00 PM to Sunset (21:01:40 PM) around Broch of Lingro on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 11: Bu

Canmore ID: 1483

Entrance: SE

The Broch and its Landscape Context

Bu (Figures 5.350 and 5.351), excavated in 1978 (Hedges 1987a; Hedges and Smith 1979; 1980), is extremely well positioned from a coastal perspective (Figure 5.352). Though it possesses extensive views of Mainland and Hoy, Bu also has a full view of the entrance to the Loch of Stenness to the north, which can be assumed to have been a very important link between Mainland Orkney and the sea itself. It also has views over the western entrance into Scapa Flow, looking over Hoy Sound, and would have been noticeable from such locales.

The Winter Solstice – Figures 5.353 and 5.354

Bu gains light within fifteen minutes after sunrise, retaining it for the day and probably losing light about twenty minutes before sunset. The SE entrance was thus well suited to this time of year.

The Equinox (21st March) – Figures 5.355 and 5.356

Bu gains light within half hour after sunrise, retaining it until twenty to fifteen minutes before sunset. Though its SE entrance would have gained ample amounts of light, a western entrance may have been marginally better for this time of year.

The Summer Solstice (21st June) Figures 5.357, 5.358 and 5.359

The site gains direct light about twenty minutes after sunrise, and retains it for the day until probably just before 20:30 PM, half an hour before sunset. Its eastern entrance was again most suitable.

Conclusions

Like many brochs in Orkney, Bu's entrance gained the maximum possible amount of light during winter especially, and would still have gained ample amounts throughout the remainder of the year too.

Figure 5.350. View from Bu. Author's Photo.

Figure 5.351. Simplified Ground Plan of Bu. (After: Hedges 1987a).

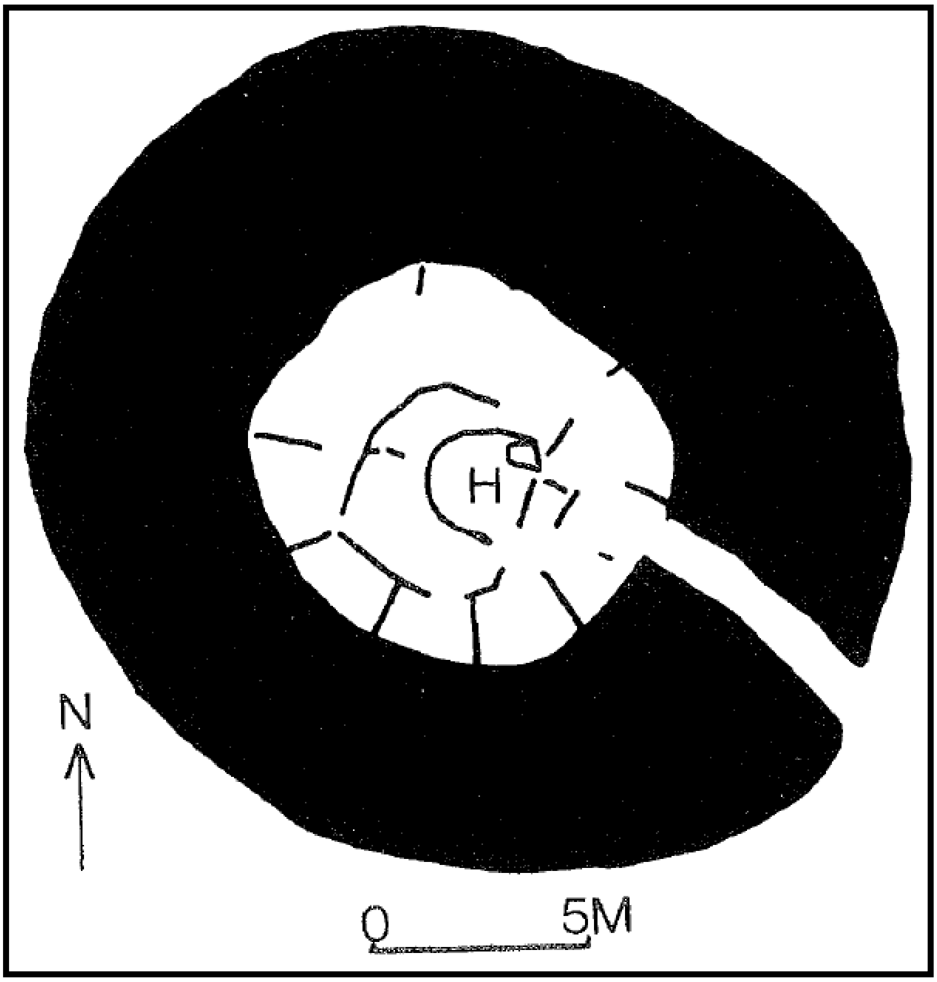


Figure 5.352. Multiple Viewsheds of Bu.

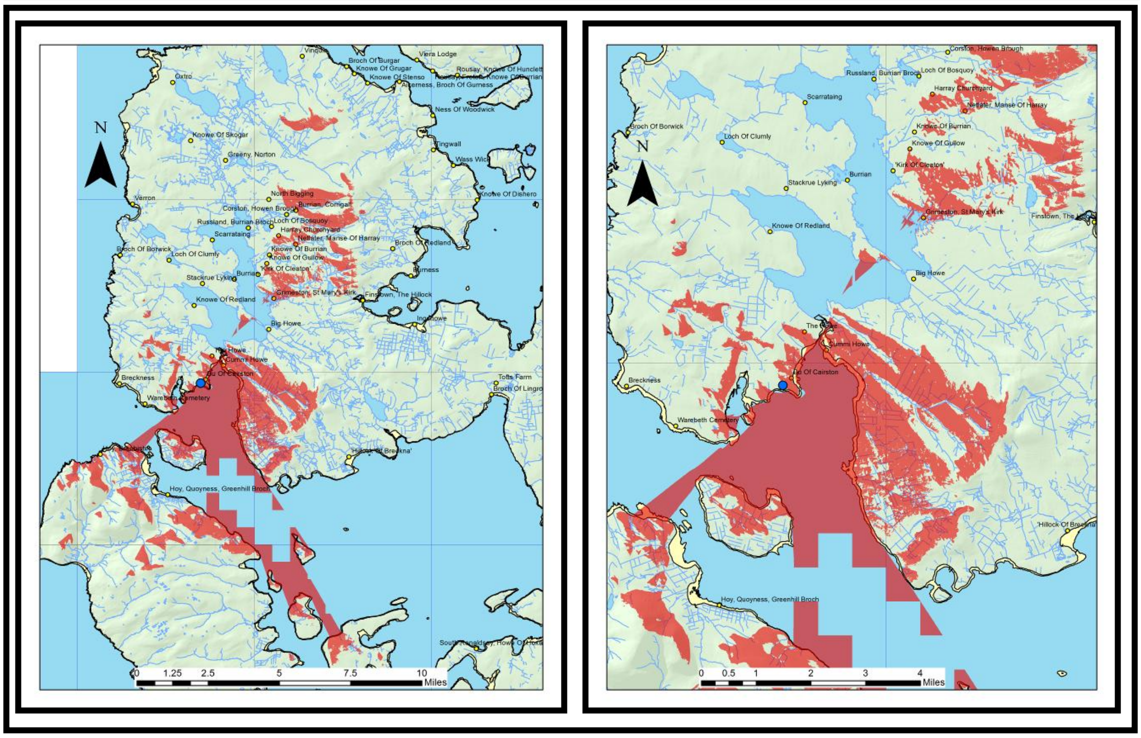


Figure 5.353. Sunrise (08:44 AM) to 13:00 PM around Bu on the Winter Solstice (21st December). Red areas denote areas of shadow.

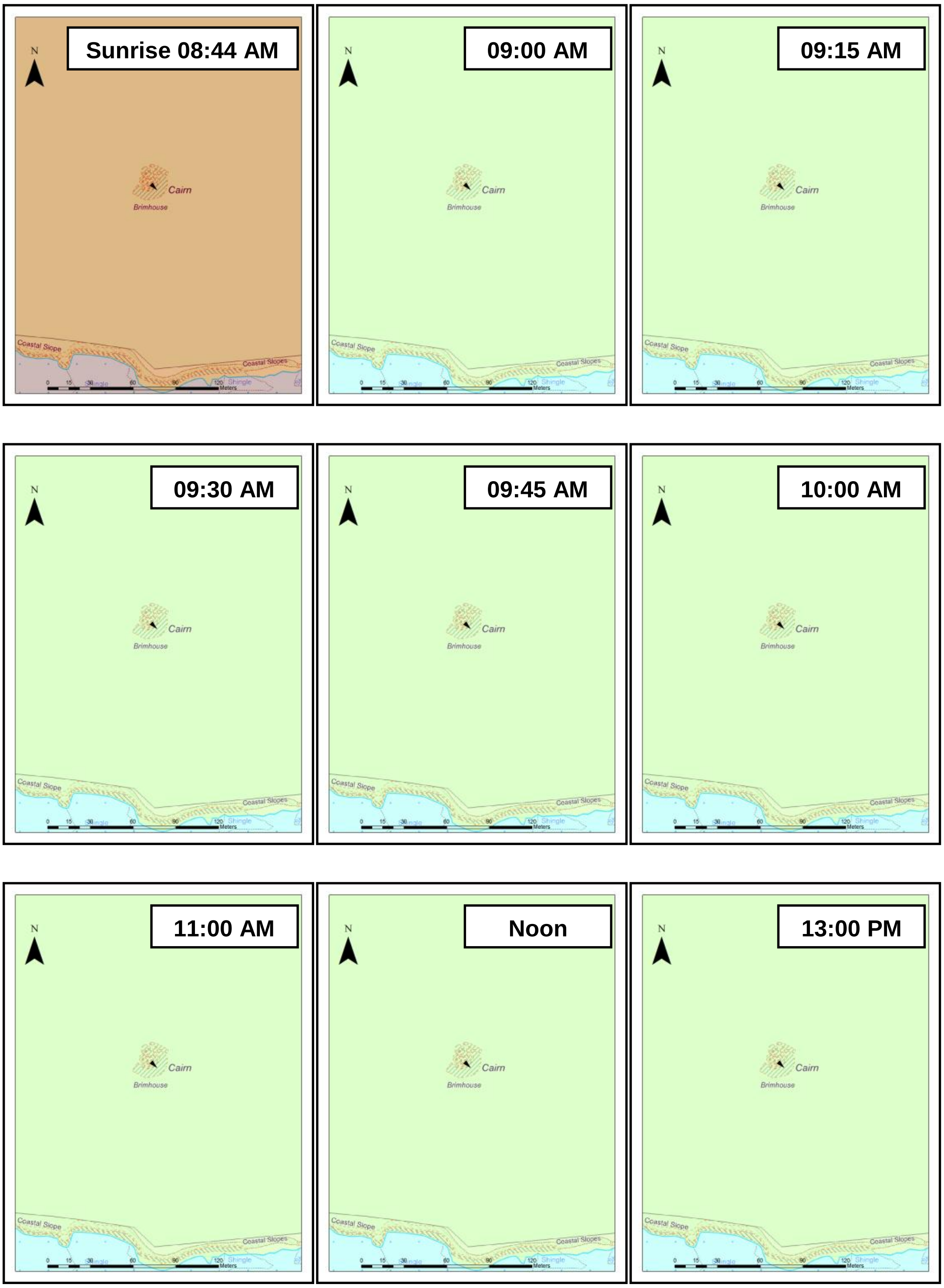


Figure 5.354. 13:30 PM to Sunset (14:47 PM) around Bu on the Winter Solstice (21st December). Red areas denote areas of shadow.

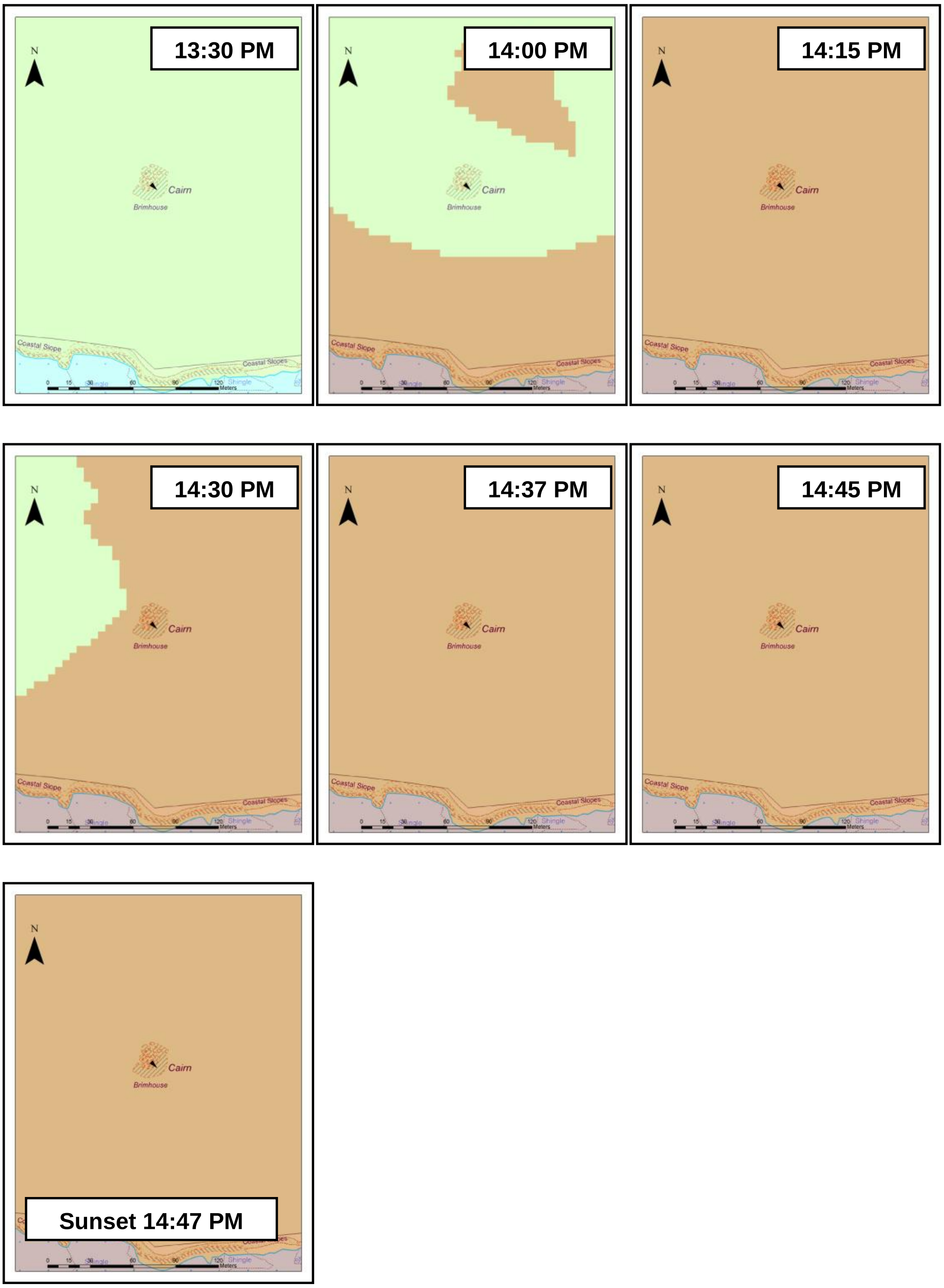


Figure 5.355. Sunrise (05:48 AM) to 11:00 AM around Bu on the Spring Equinox (21st March). Red areas denote areas of shadow.

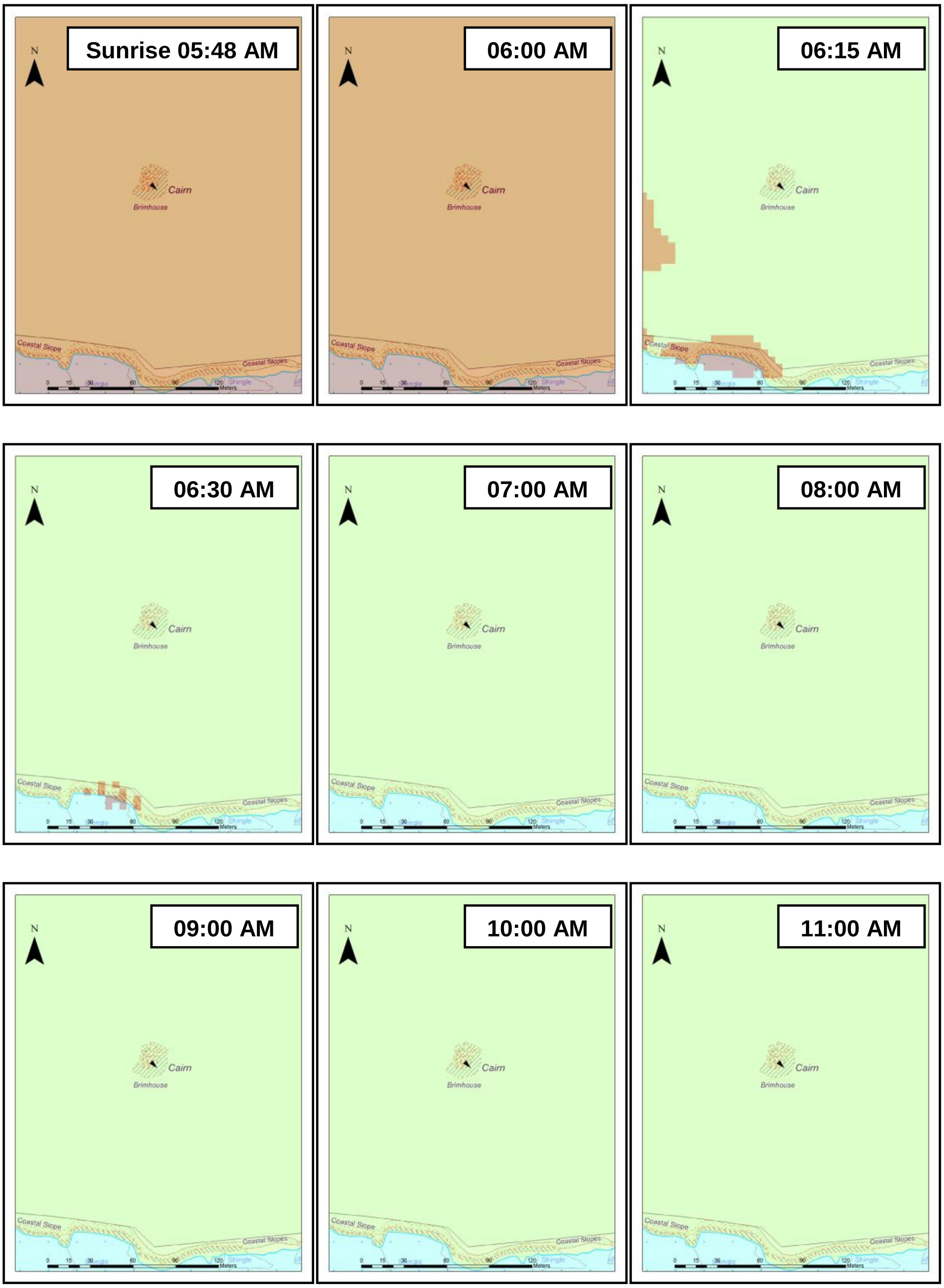


Figure 5.356. Noon to Sunset (18:02:15 PM) around Bu on the Spring Equinox (21st March). Red areas denote areas of shadow.

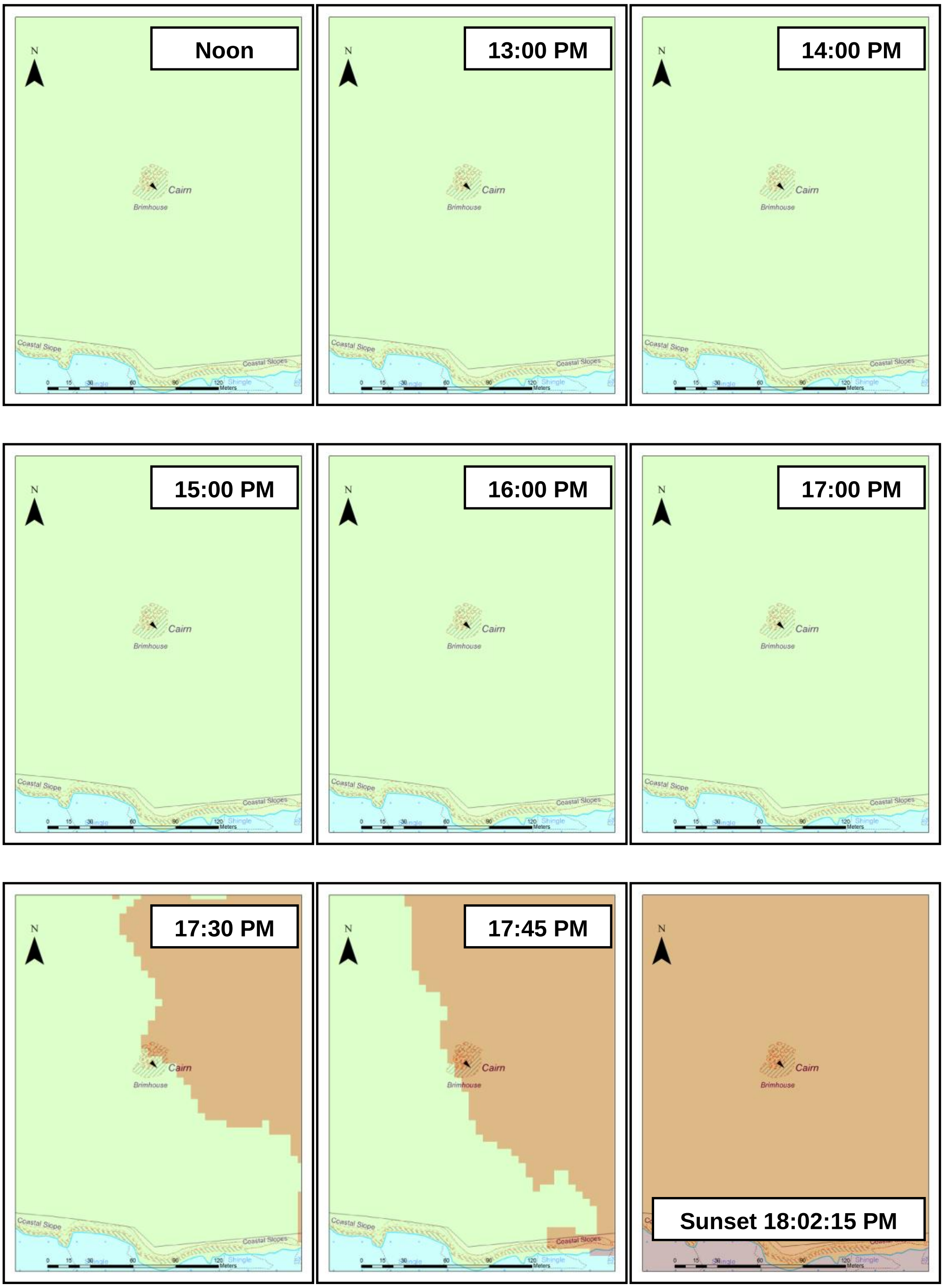


Figure 5.357. Sunrise (02:36:40 AM) to 08:00 AM around Bu on the Summer Solstice (21st June). Red areas denote areas of shadow.

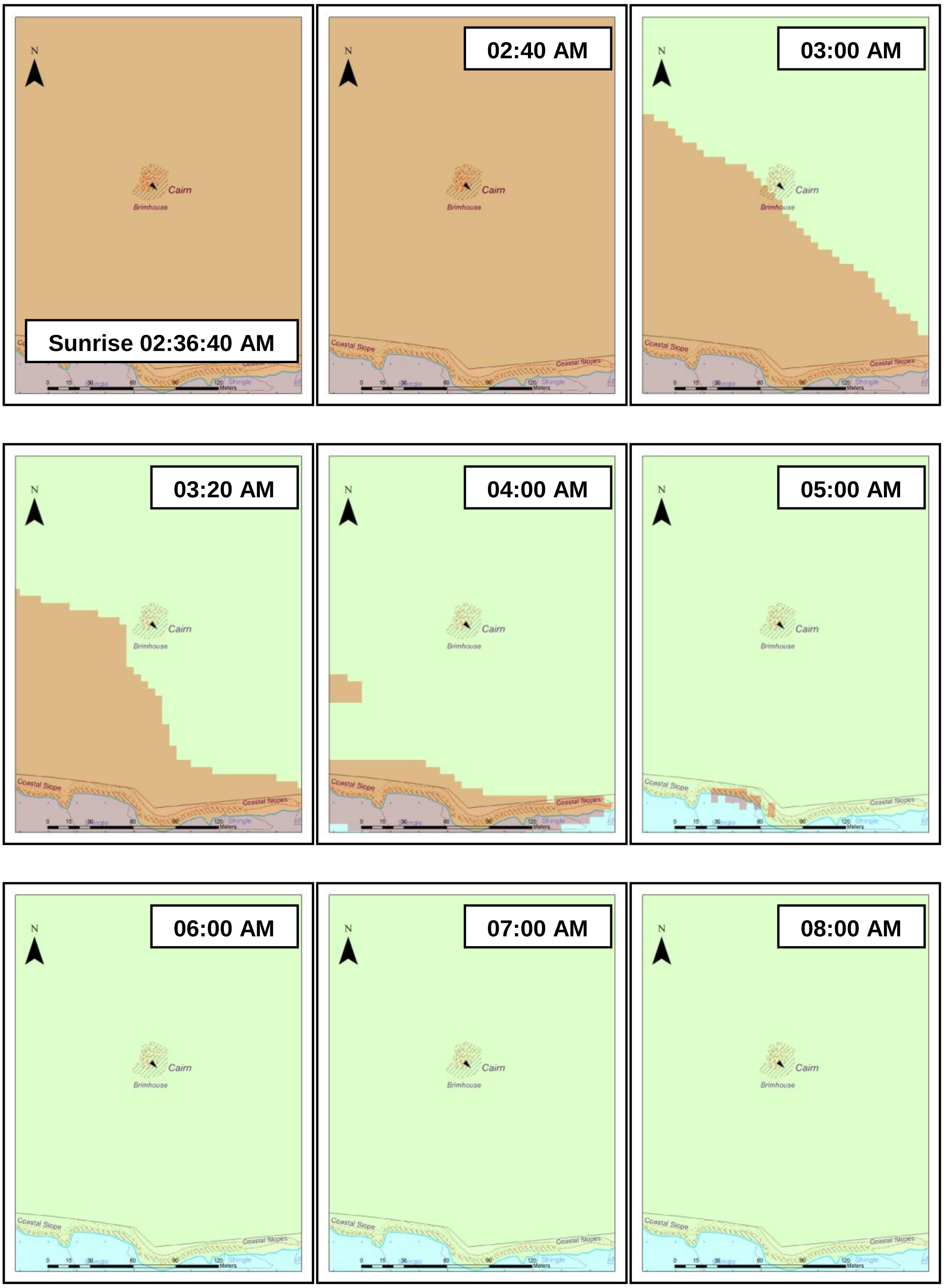


Figure 5.358. 09:00 AM to 17:00 PM around Bu on the Summer Solstice (21st June). Red areas denote areas of shadow.

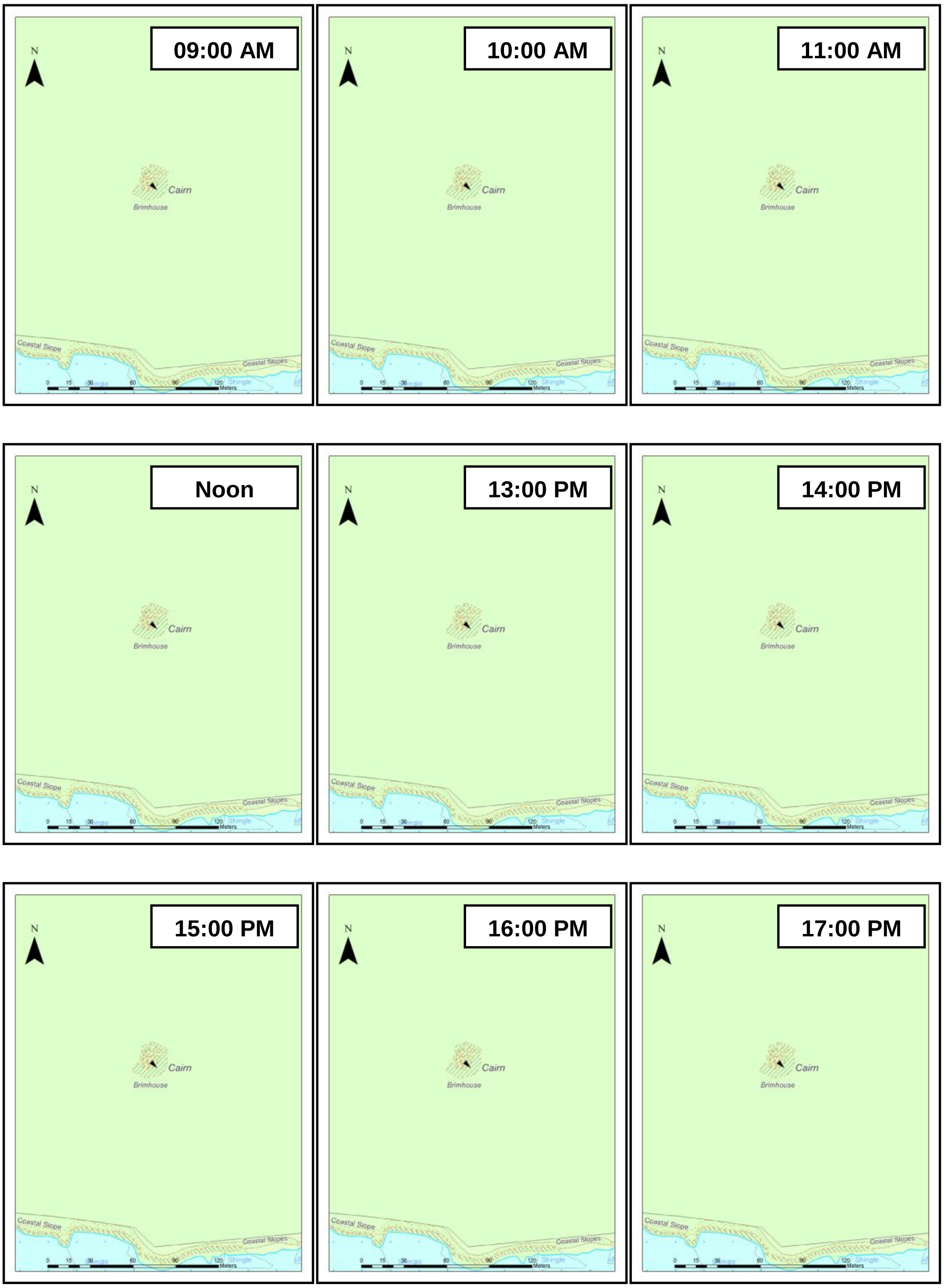
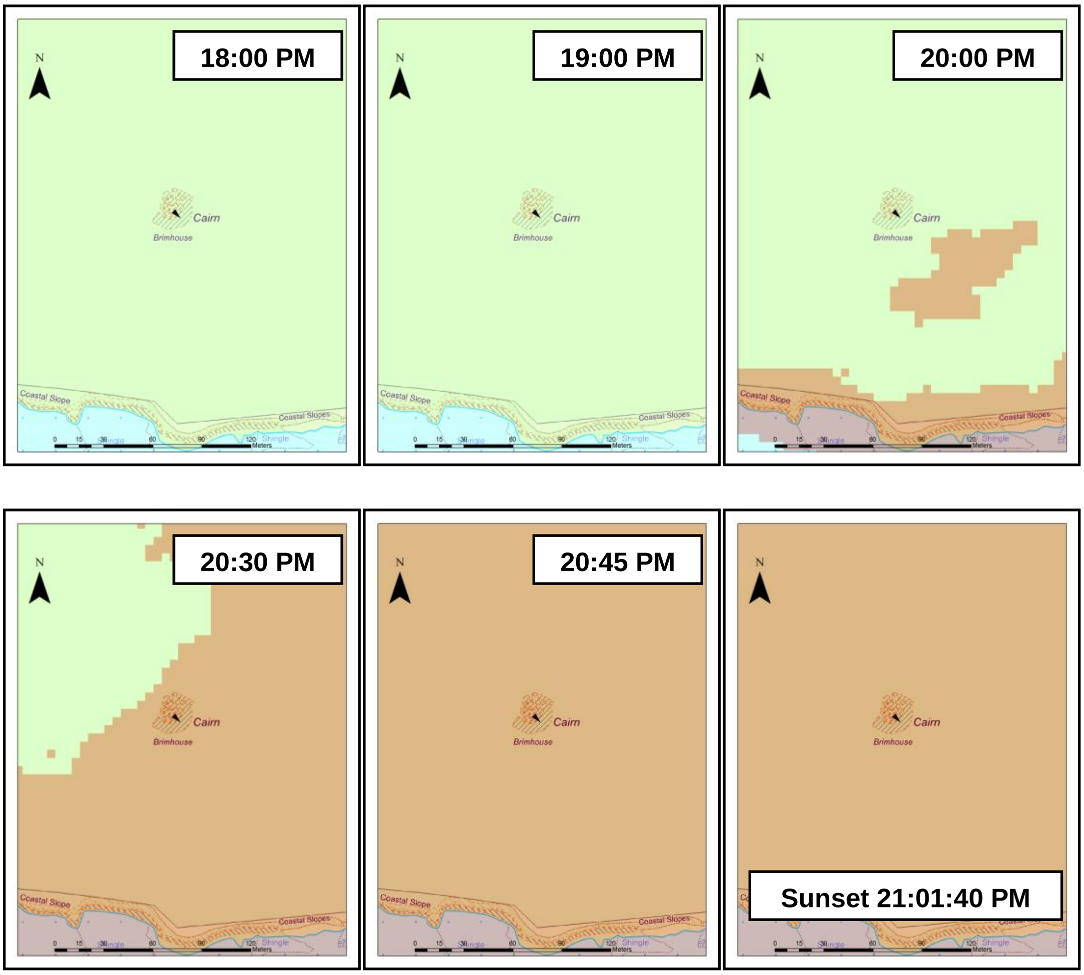


Figure 5.359. 18:00 PM to Sunset (21:01:40 PM) around Bu on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 12: Broch of Burrian

Canmore ID: 3679

Entrance: SE

The Broch and its Landscape Context

Excavated by Traill (1890) in 1870 and 1871 (for further work on Burrian, also see: Heald 2005; MacGregor 1975; RCAHMS 1946: 45-47; Sharman 2005), this broch (Figures 5.360) is located on a small headland, overlooking the sea to the south of North Ronaldsay (Figure 5.361). Though possessing little visibility of its own island, this location permits extensive views across the sea, with excellent visibility of Westray, Sanday, Rousay, Egilsay, Papa Westray, Shapinsay, Stronsay, Mainland and even Hoy, which is far to the south. As such, it would have been well placed to observe boats travelling between the Orkney Islands and Shetland. As it is the most northerly broch in Orkney, it may have even been considered as one of the last possible stops in the islands, and its visibility would have emphasised this status and position.

The Winter Solstice – Figures 5.362 and 5.363

The SE entrance is perfect for this time of year and gains light at sunrise. The broch and its landscape then retain light until approximately ten to fifteen minutes before sunset.

The Equinox (21st March) – Figures 5.364 and 5.365

Again, the entrance gains light at sunrise, and the landscape quickly gains light during the next fifteen minutes. The broch then retains light probably until just before sunset, losing it sometime in the last fifteen minutes of the day. The eastern entrance is thus most beneficial for this location.

The Summer Solstice (21st June) Figures 5.366, 5.367 and 5.368

The north-eastern side of the broch gains direct light at sunrise again, and retains it for the entire day, until approximately 20:30 PM, probably around half an hour before sunset.

Conclusions

The SE entrance is the best available for this site, gaining direct sunlight at dawn, as the sun rises, especially during mid-winter.

Figure 5.360. Ground Plan of the Broch of Burrian, North Ronaldsay. (After: MacGregor 1975: 66; Fig. 2).

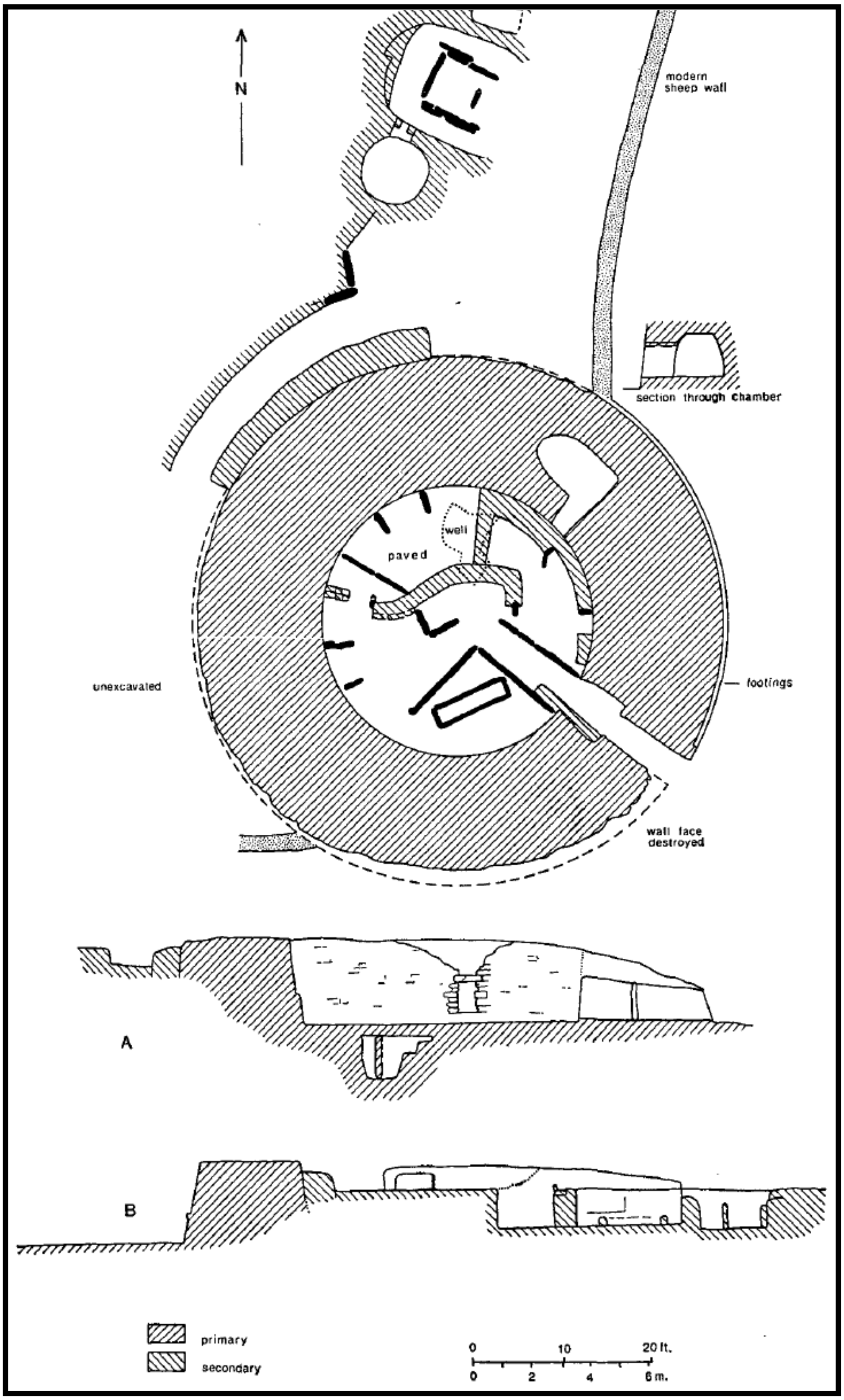
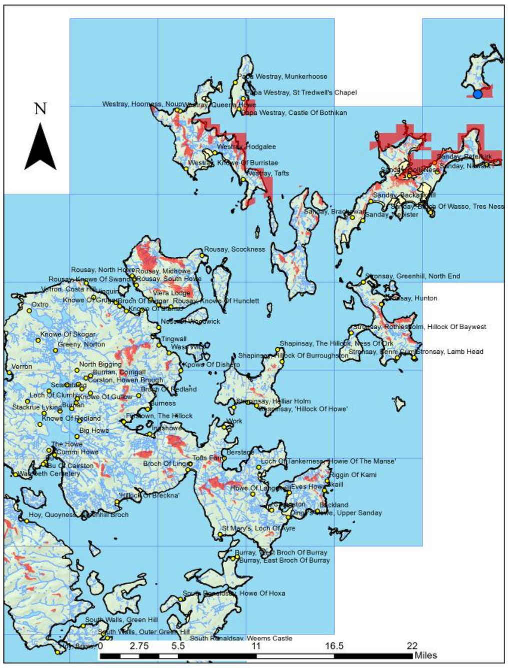
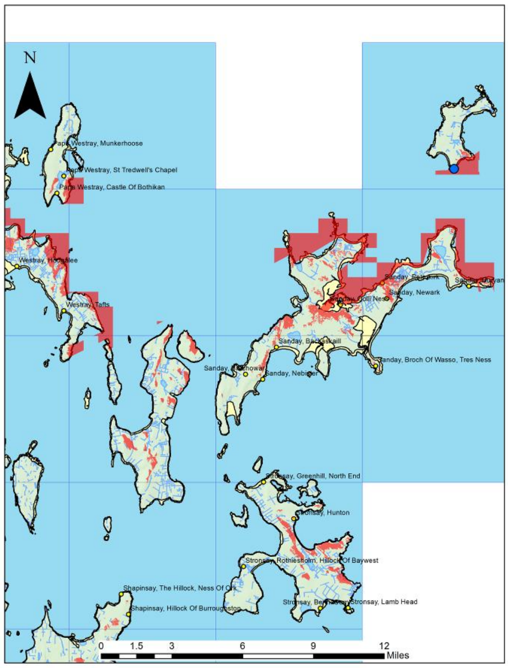


Figure 5.361. Multiple Viewsheds of Broch of Burrian





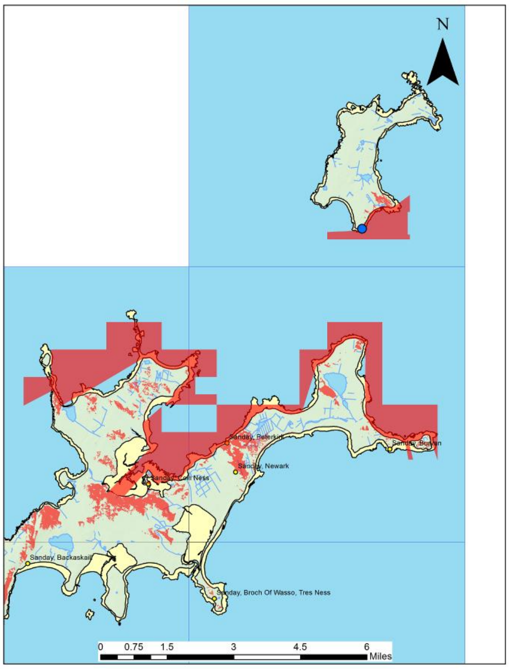


Figure 5.362. Sunrise (08:44 AM) to 13:00 PM around Broch of Burrian on the Winter Solstice (21st December). Red areas denote areas of shadow.

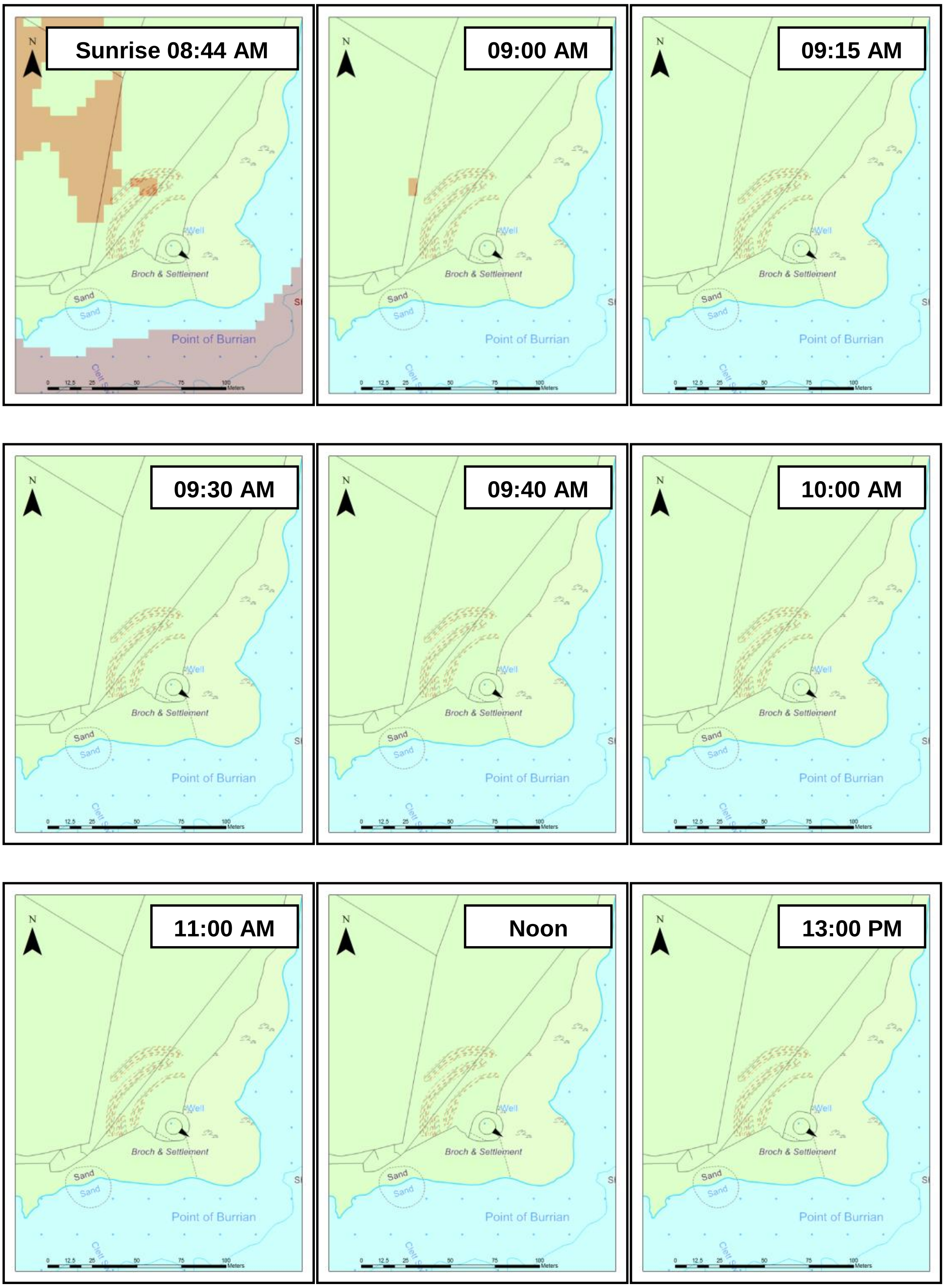


Figure 5.363. 13:30 PM to Sunset (14:47 PM) around Broch of Burrian on the Winter Solstice (21st December). Red areas denote areas of shadow.

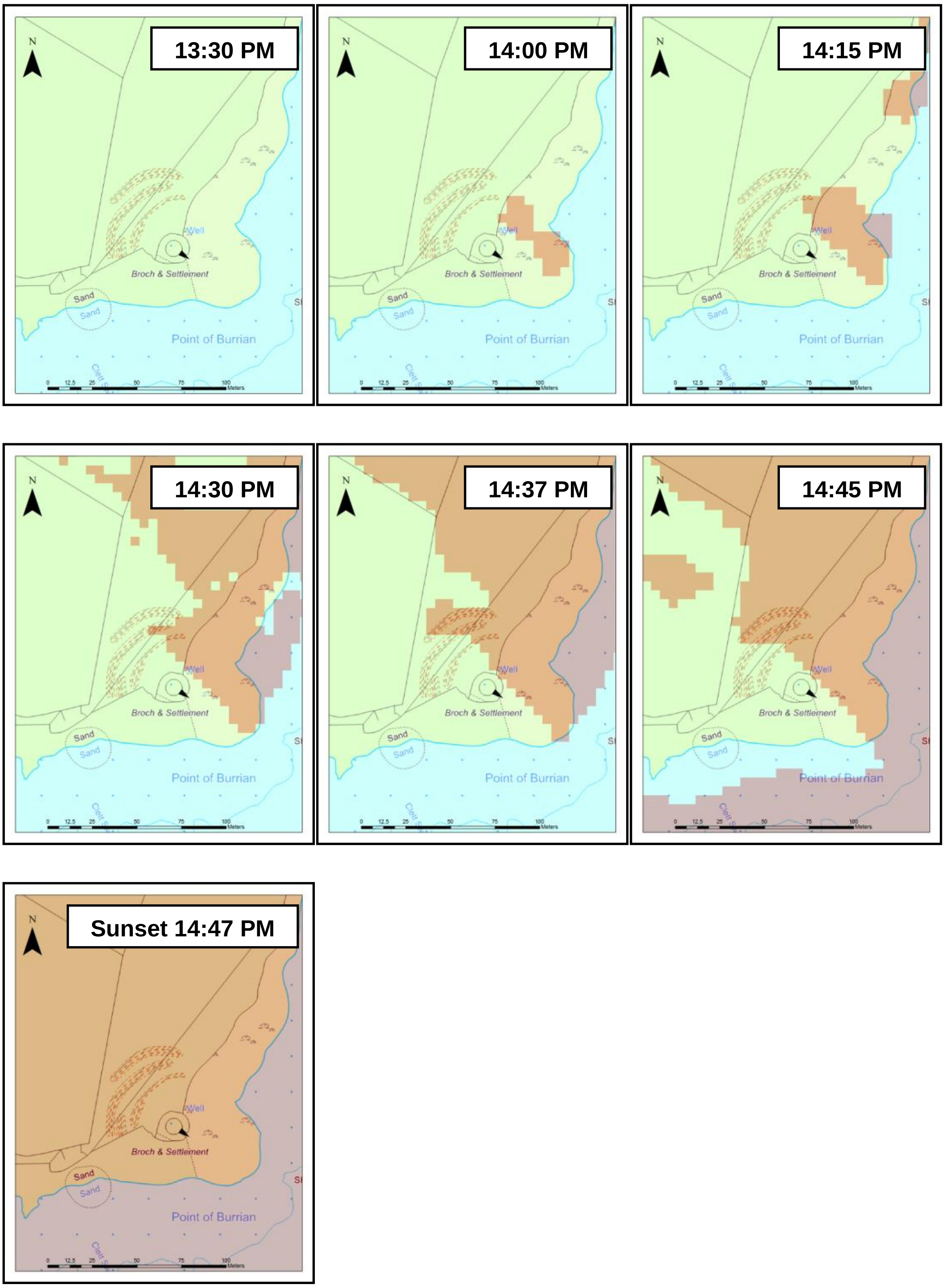


Figure 5.364. Sunrise (05:48 AM) to 11:00 AM around Broch of Burrian on the Spring Equinox (21st March). Red areas denote areas of shadow.

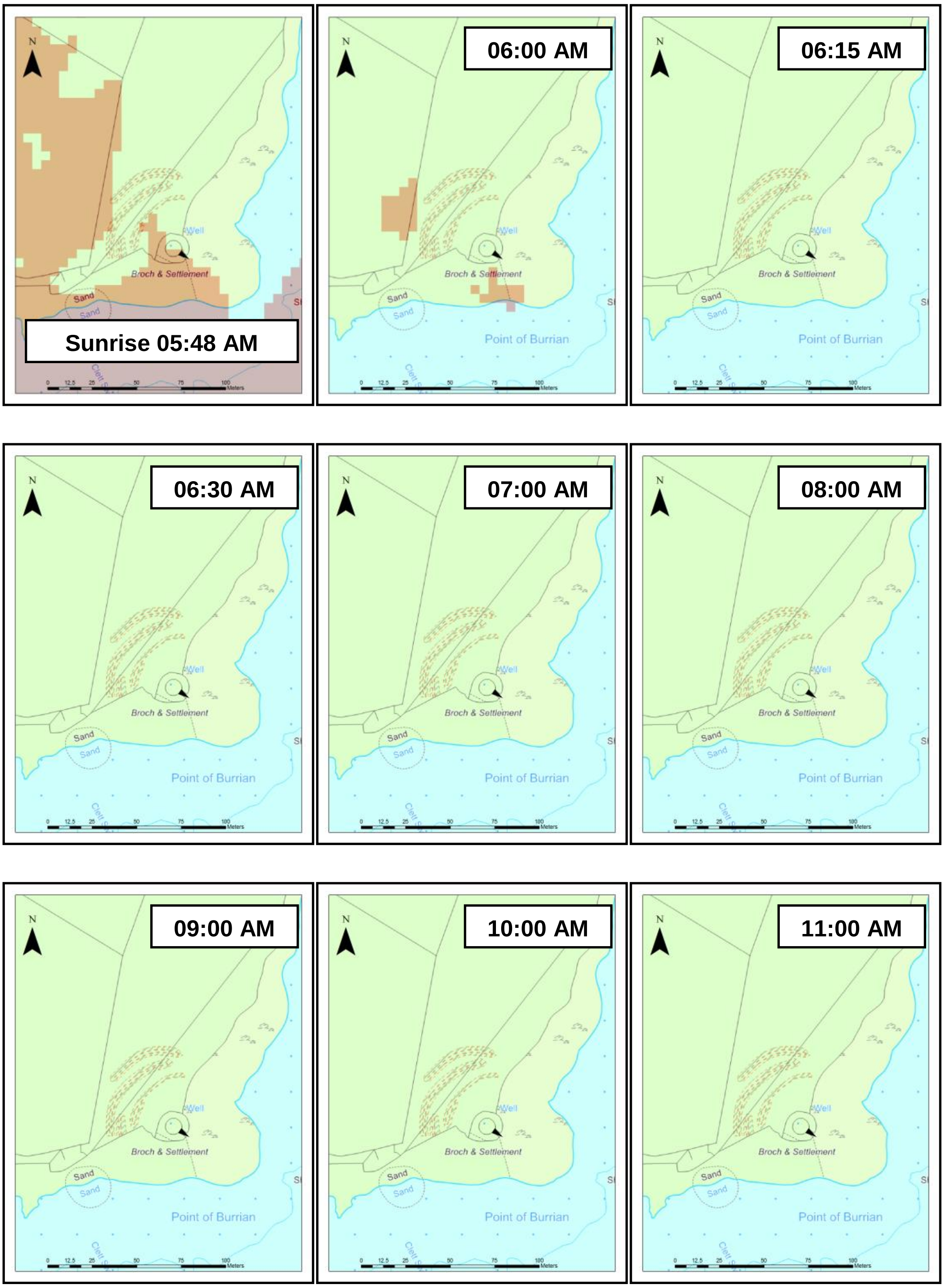


Figure 5.365. Noon to Sunset (18:02:15 PM) around Broch of Burrian on the Spring Equinox (21st March). Red areas denote areas of shadow.

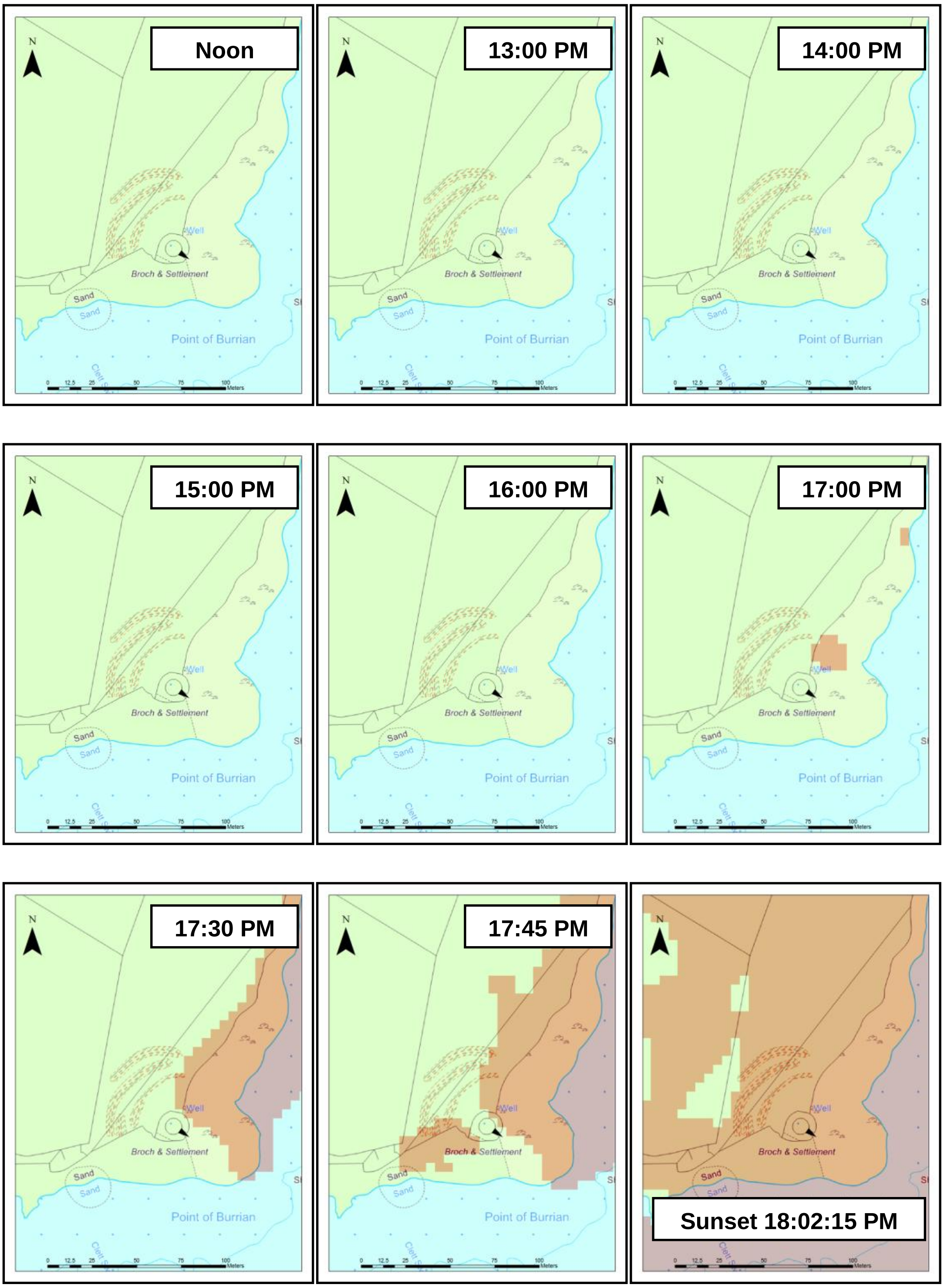


Figure 5.366. Sunrise (02:36:40 AM) to 08:00 AM around Broch of Burrian on the Summer Solstice (21st June). Red areas denote areas of shadow.

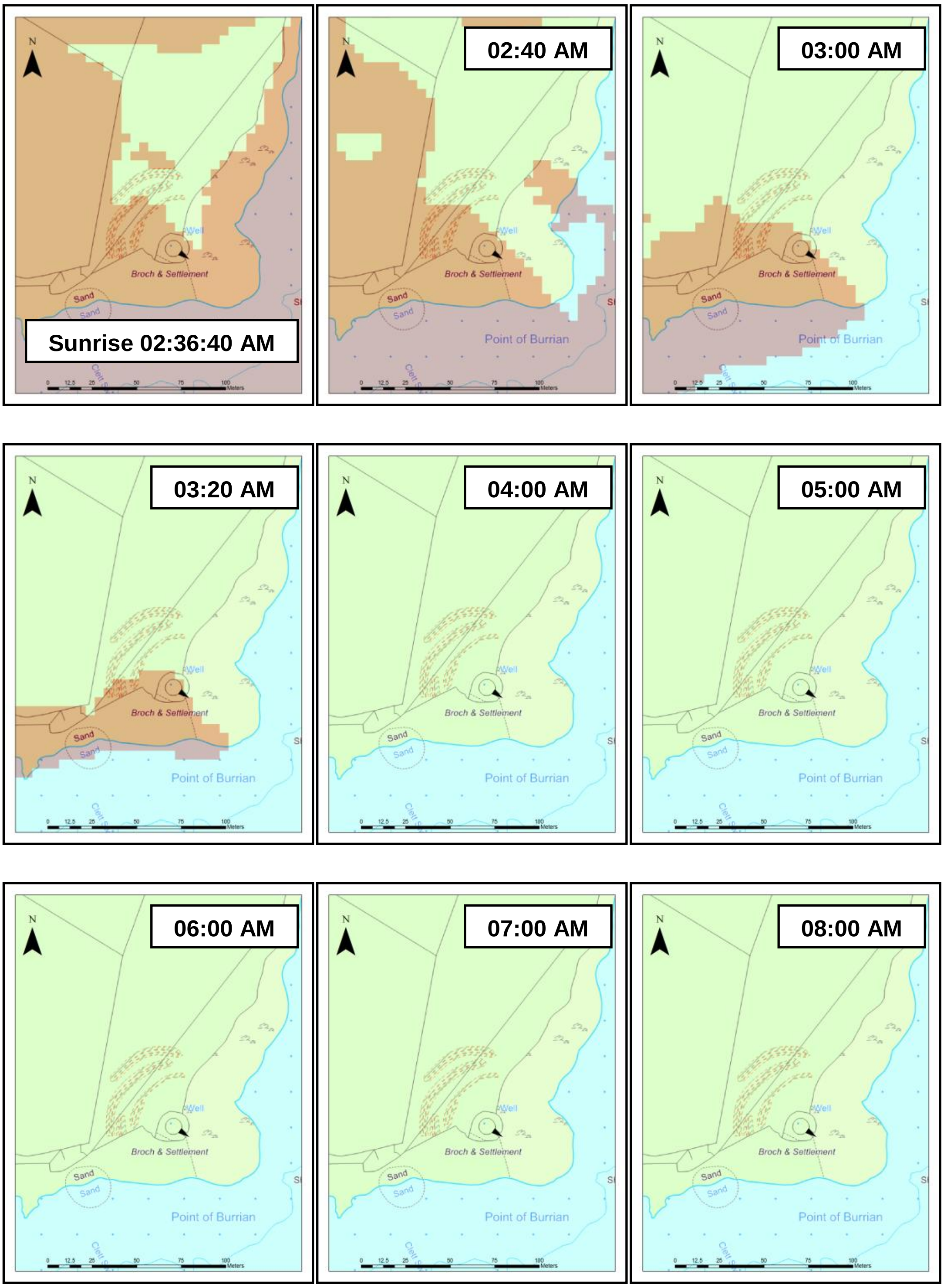
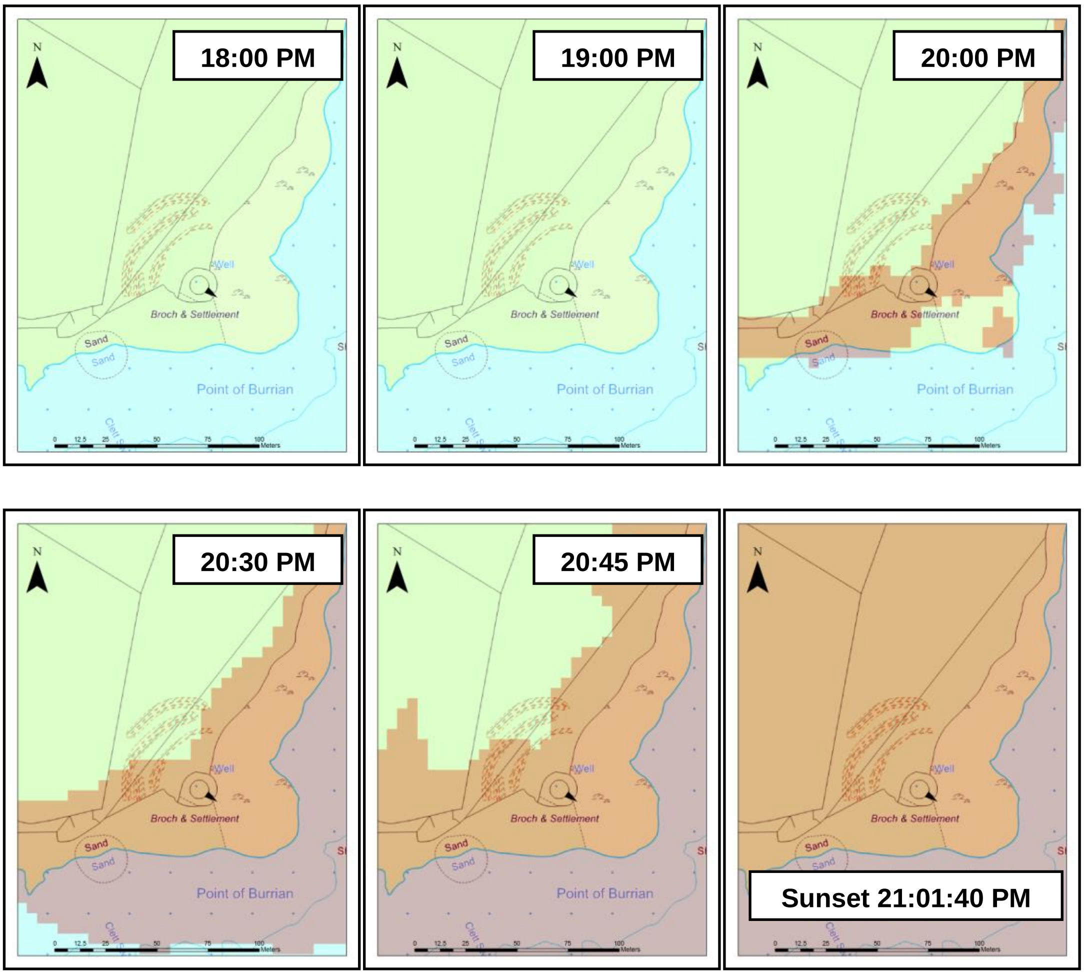


Figure 5.367. 09:00 AM to 17:00 PM around Broch of Burrian on the Spring Equinox (21st March). Red areas denote areas of shadow.

Figure 5.368. 18:00 PM to Sunset (21:01:40 PM) around Broch of Burrian on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 13: Manse of Harray

Canmore ID: 2030

Entrance: SE

The Broch and its Landscape Context

Excavated in 1860 by Traill (Petrie 1873: 79; cf. Hedges 1987b: 73-75; RCAHMS 1946: 13-14), this broch (Figure 5.369) stands on low flat ground. Nevertheless, it still has excellent views across Mainland Orkney and Hoy (Figure 5.370), with particularly good visibility of the lochs of Harray and Stenness, and possessing views of multiple brochs which lie close to these features, such as Knowe of Gullow, Scarrataing and Burrian.

The Winter Solstice – Figures 5.371 and 5.372

Manse of Harray gains direct light within half and hour after sunrise, retaining a good amount of light for the remainder of the day, until just after 14:30 PM, approximately fifteen to twenty minutes before sunset. Its SE entrance is thus most suitable for this time of year.

The Equinox (21st March) – Figures 5.373 and 5.374

Interestingly, the broch gains direct light thirty to forty minutes after sunrise, and then retains it until at least two minutes before the sun sets. Therefore, a western entrance would have benefited more during the spring and autumn.

The Summer Solstice (21st June) Figures 5.375, 5.376 and 5.377

Again, the broch gains direct light thirty to forty minutes after sunrise, and retains it until the last few minutes before sunset. A western entrance would thus have been more suitable for summer.

Conclusions

The SE entrance at Manse of Harray is only beneficial for the winter months. Throughout the remainder of the year, a western entrance would have been more suitable, admitting noticeably more direct light during these periods. However, an entrance facing the SW during winter would have probably gained just as much direct light as the SE entrance did, and so this suggests that the inhabitants were keen to harness the winter morning light, despite its limitations throughout the remainder of the year.

Figure 5.369. Ground Plan of Manse of Harray.
(After: Petrie 1873: 79; Fig. 6).

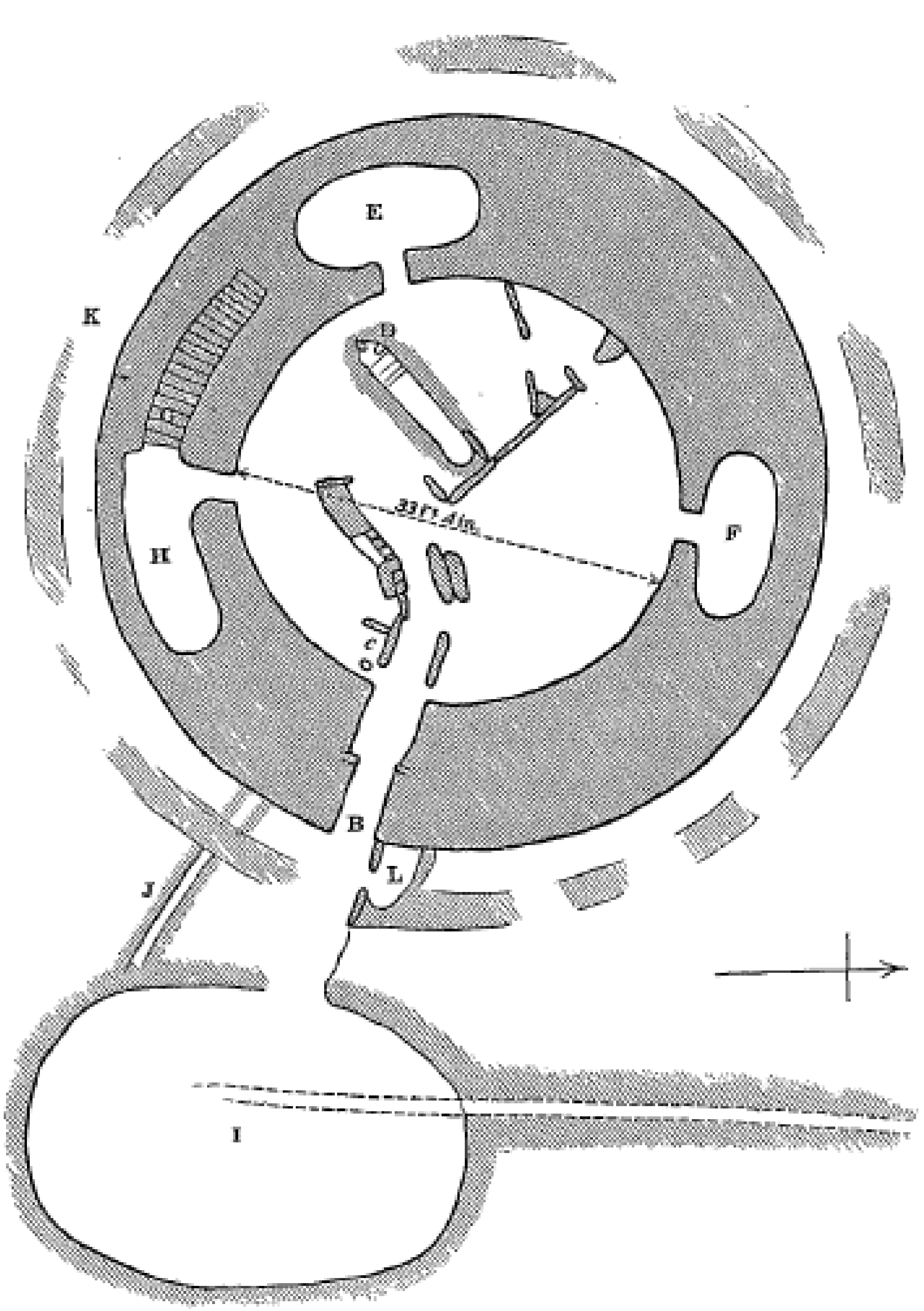


Figure 5.370. Multiple Viewsheds of Manse of Harray

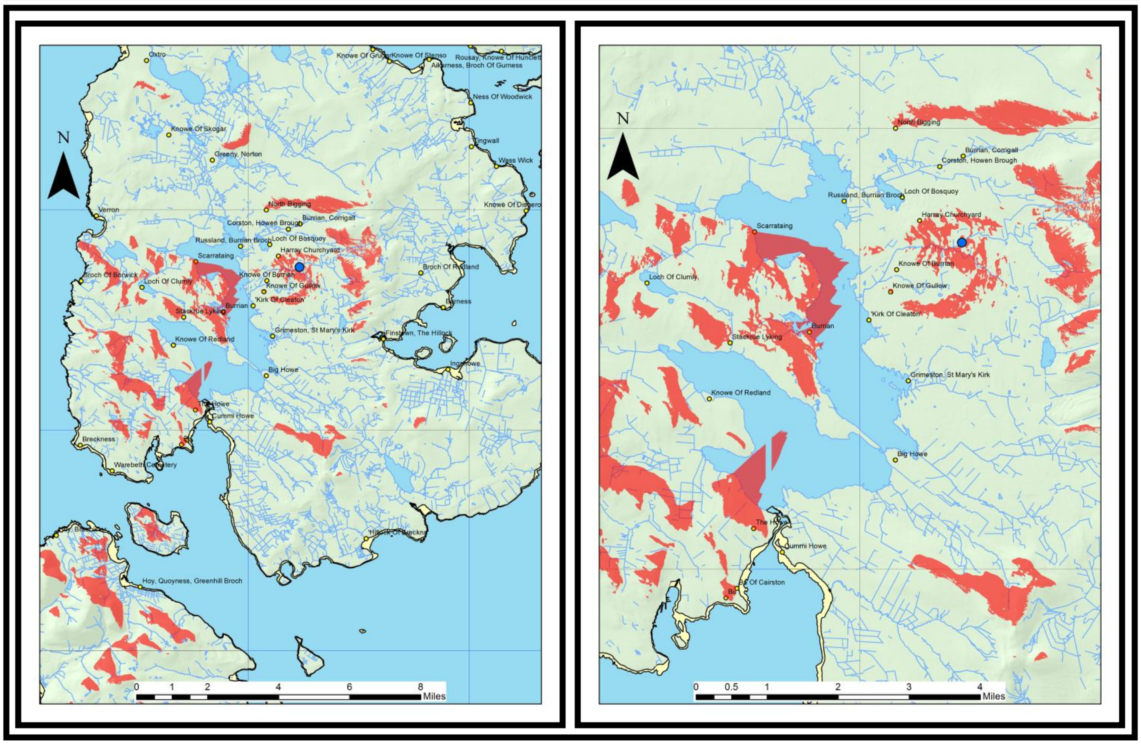


Figure 5.371. Sunrise (08:44 AM) to 13:00 PM around Manse of Harray on the Winter Solstice (21st December). Red areas denote areas of shadow.

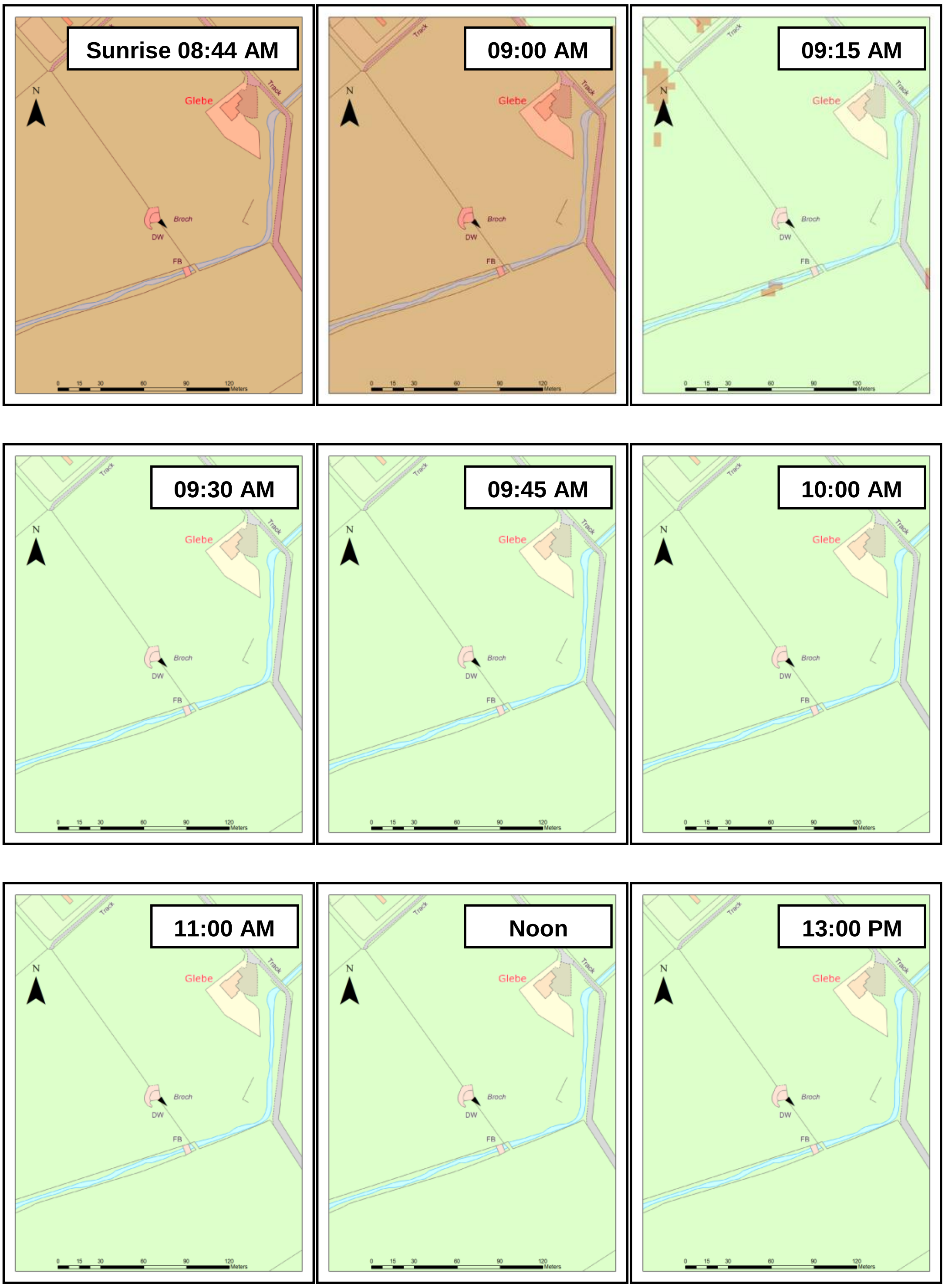


Figure 5.372. 13:30 PM to Sunset (14:47 PM) around Manse of Harray on the Winter Solstice (21st December). Red areas denote areas of shadow.

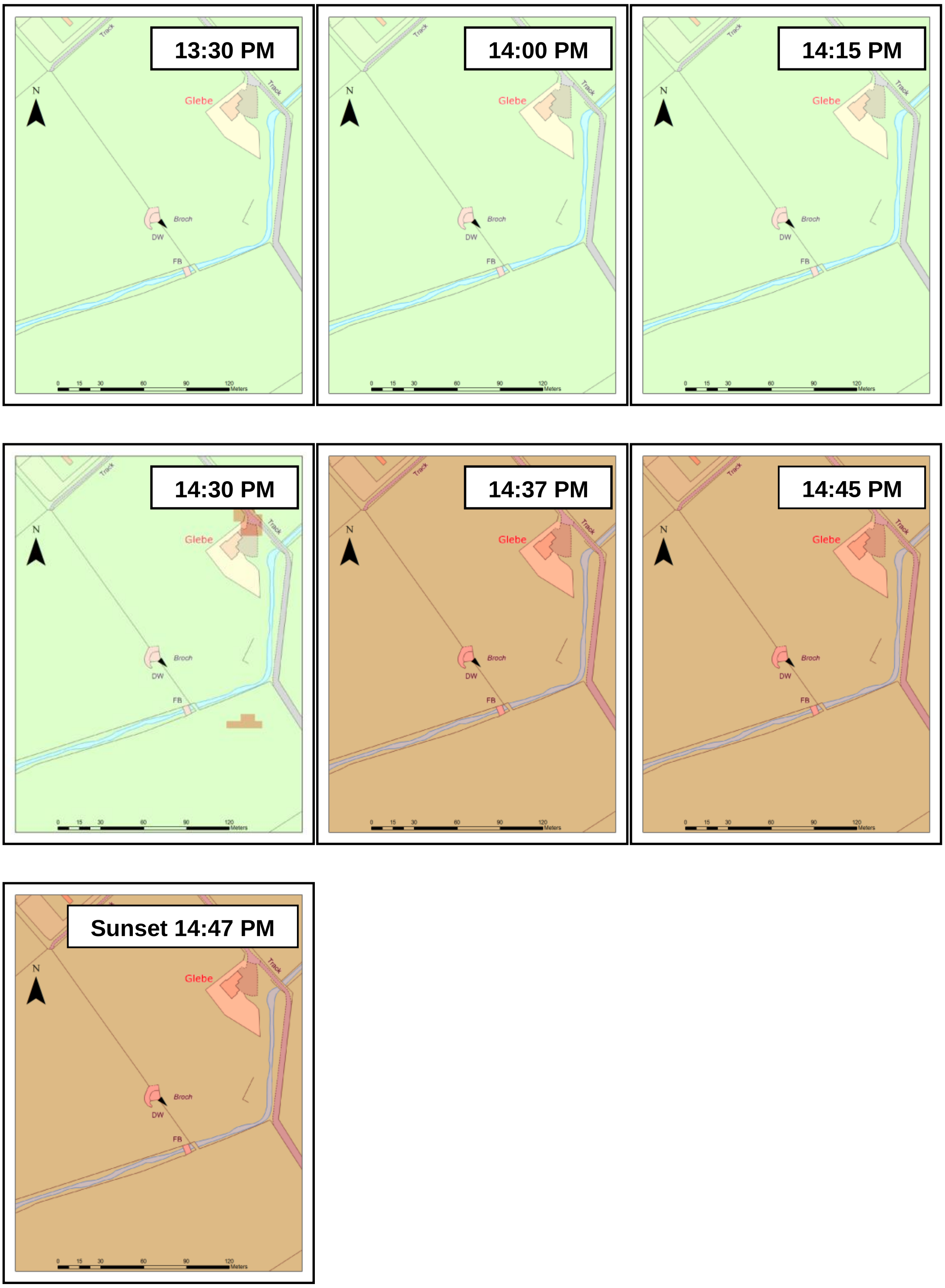


Figure 5.373. Sunrise (05:48 AM) to 11:00 AM around Manse of Harray on the Spring Equinox (21st March). Red areas denote areas of shadow.

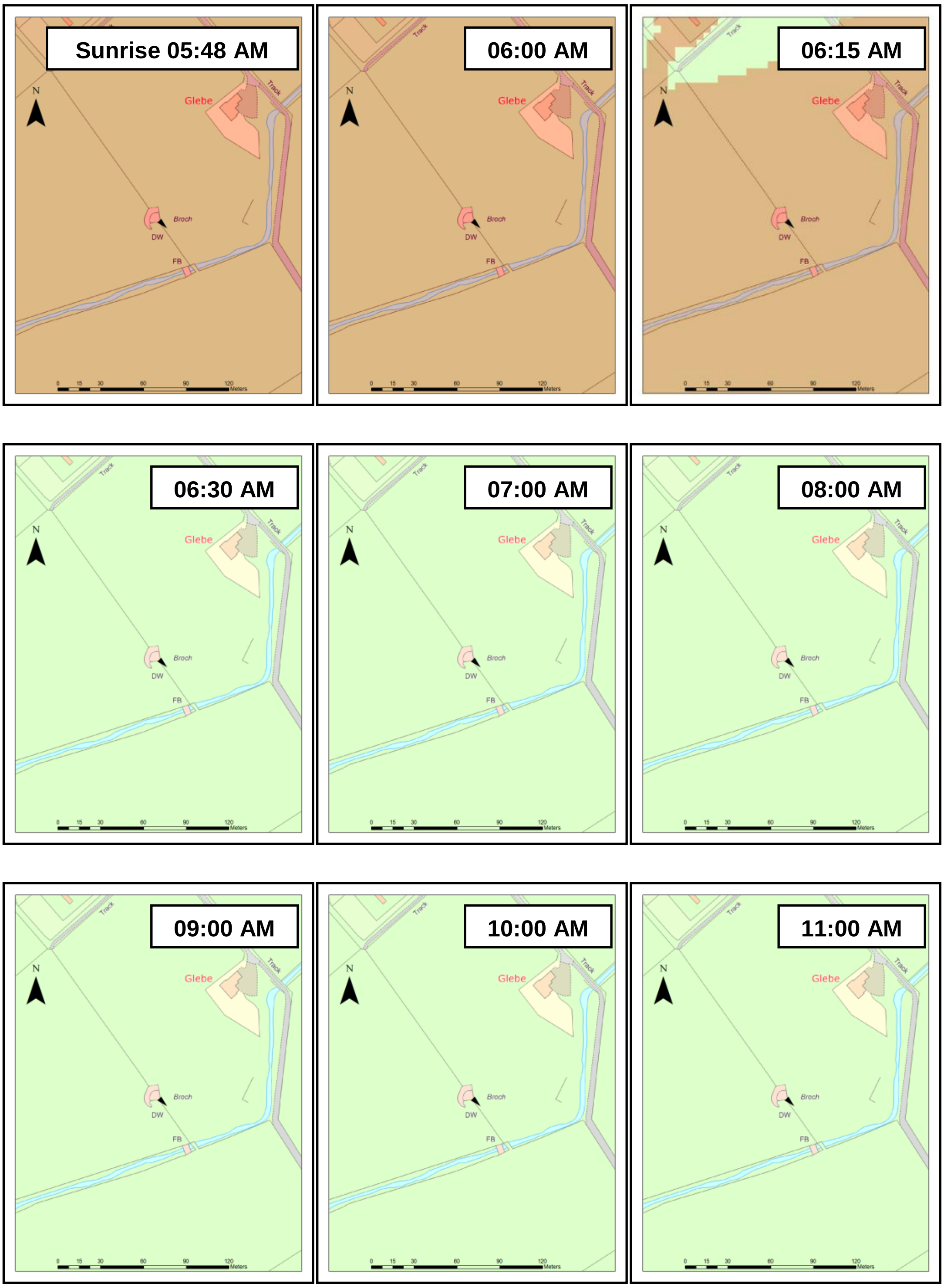


Figure. 5.374. Noon to Sunset (18:02:15 PM) around Manse of Harray on the Spring Equinox (21st March). Red areas denote areas of shadow.

Figure 5.375. Sunrise (02:36:40 AM) to 09:00 AM around Manse of Harray on the Summer Solstice (21st June). Red areas denote areas of shadow.

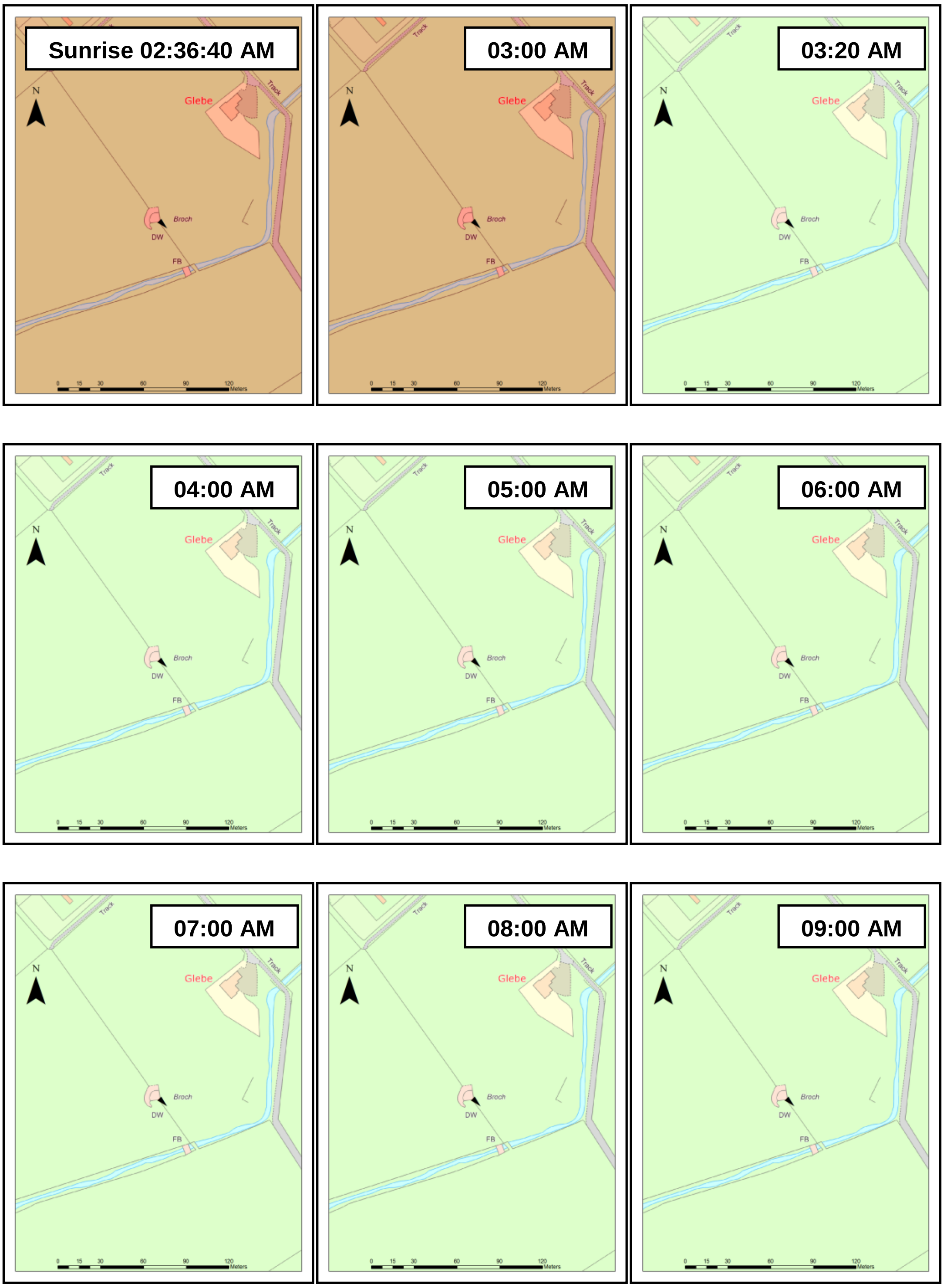
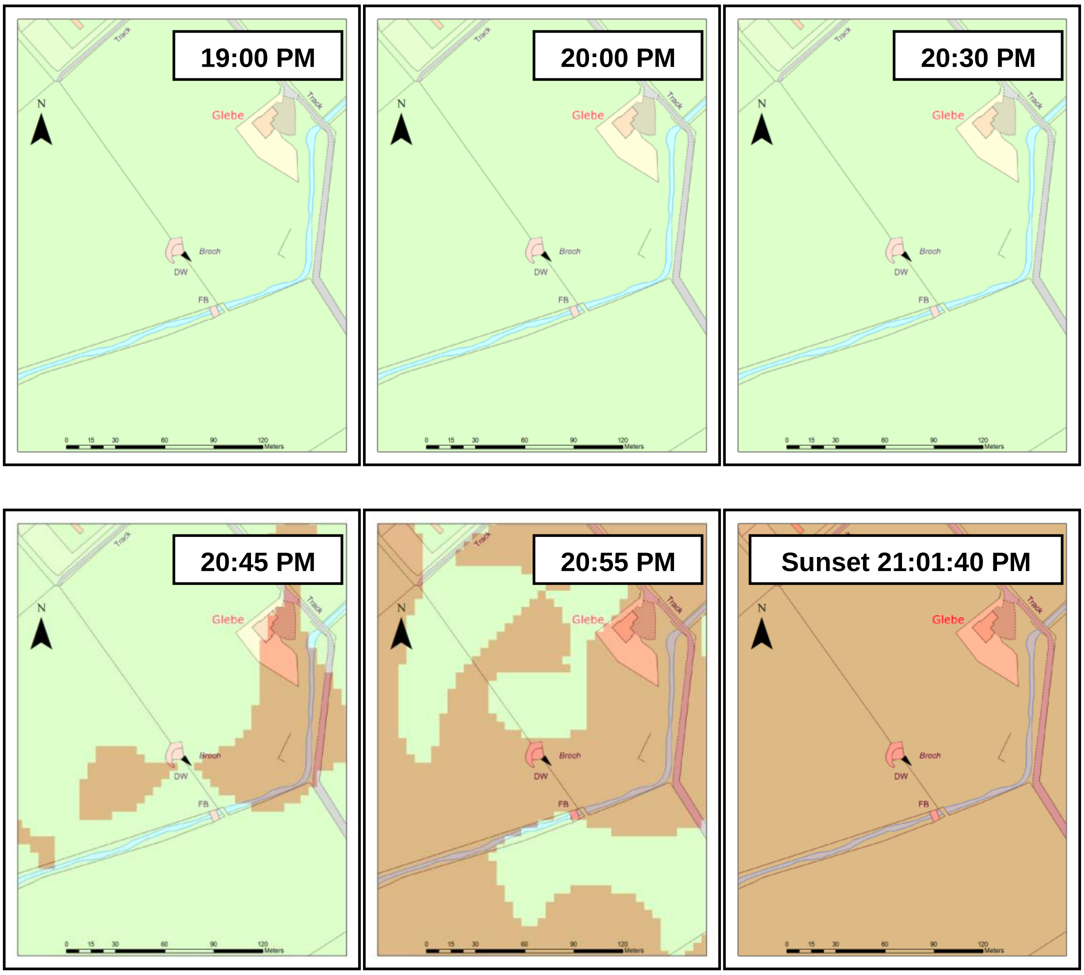


Figure 5.376. 10:00 AM to 18:00 PM around Manse of Harray on the Summer Solstice (21st June). Red areas denote areas of shadow.

Figure 5.377. 19:00 PM to Sunset (21:01:40 PM) around Manse of Harray on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 14: Broch of Borwick

Canmore ID: 1660

Entrance: SE

The Broch and its Landscape Context

Excavated in 1881 by Watt (1882; for further work, also see: Lynn and Bell 1987; 1983; Moore 2011), the Broch of Borwick (Figures 5.378, 5.379 and 5.380) stands upon the summit of a cliff promontory, 18.3-24.4 metres above the sea, with a small sandy bay on its south side, and rolling, cultivated land running right up to it. A small stream runs past the site immediately to the E, and the promontory was originally cut off from the flat land beyond by an outer wall (MacKie 2002a: 217). Unlike many brochs in Orkney, Borwick has limited views of land (and no views of any other broch), but like so many other sites in Orkney, it has excellent views of the sea (Figure 5.381). However, although this particular broch only has a view of the small bay on which it is located, any boat travelling up the western coast of Mainland would have been visible to it.

The Winter Solstice – Figures 5.382 and 5.383

The entrance would have been the first area of the broch to receive direct sunlight, approximately forty minutes after sunrise. The site then retains light until just before 14:00 PM, about fifty minutes before sunset. Though the site receives comparably little direct light, the SE entrance would have maximised the amount the site did gain.

The Equinox (21st March) – Figures 5.384 and 5.385

The broch gains direct light some time between 06:30 AM and 07:00 AM, the entrance probably gaining light about an hour after sunrise. The broch then retains light until around 17:30 PM, though much of the landscape around it remains in direct sunlight until sunset itself. Therefore, a western entrance may have benefited more during this time of year.

The Summer Solstice (21st June) – Figures 5.386, 5.387 and 5.388

The site gains direct sunlight some time after 03:20 AM, approximately forty to fifty minutes after sunrise. The site then retains light until sunset. Therefore, a western entrance would have been much more suitable for the summer months.

Conclusions

Like Manse of Harray, the SE entrance is only suitable during the winter months, with a western entrance being more beneficial during the rest of the year. However, as the broch is located on a cliff peninsula, with its doorway facing towards the landward side, it is possible that the SE entrance was considered the safest and easiest option, as opposed to a potentially dangerous western approach along the cliff edge.

Figure 5.378. Ground Plan of the Broch of Borwick.
(After: RCAHMS 1946: no. 679).

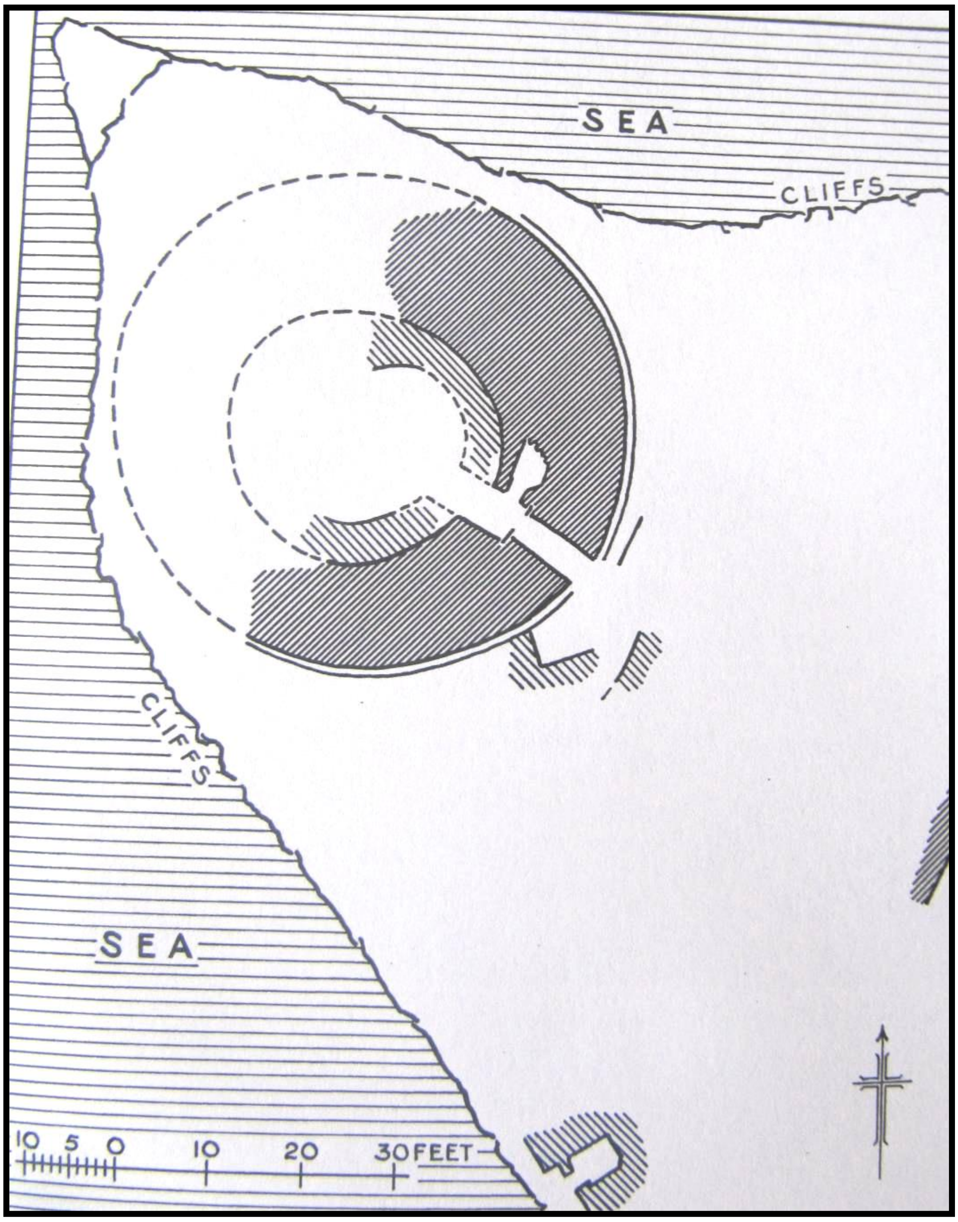


Figure 5.379. Borwick Broch. Author's Photo.

Figure 5.380. View from Entrance of Borwick Broch. Author's Photo.

Figure 5.381. Multiple Viewsheds of Broch of Borwick

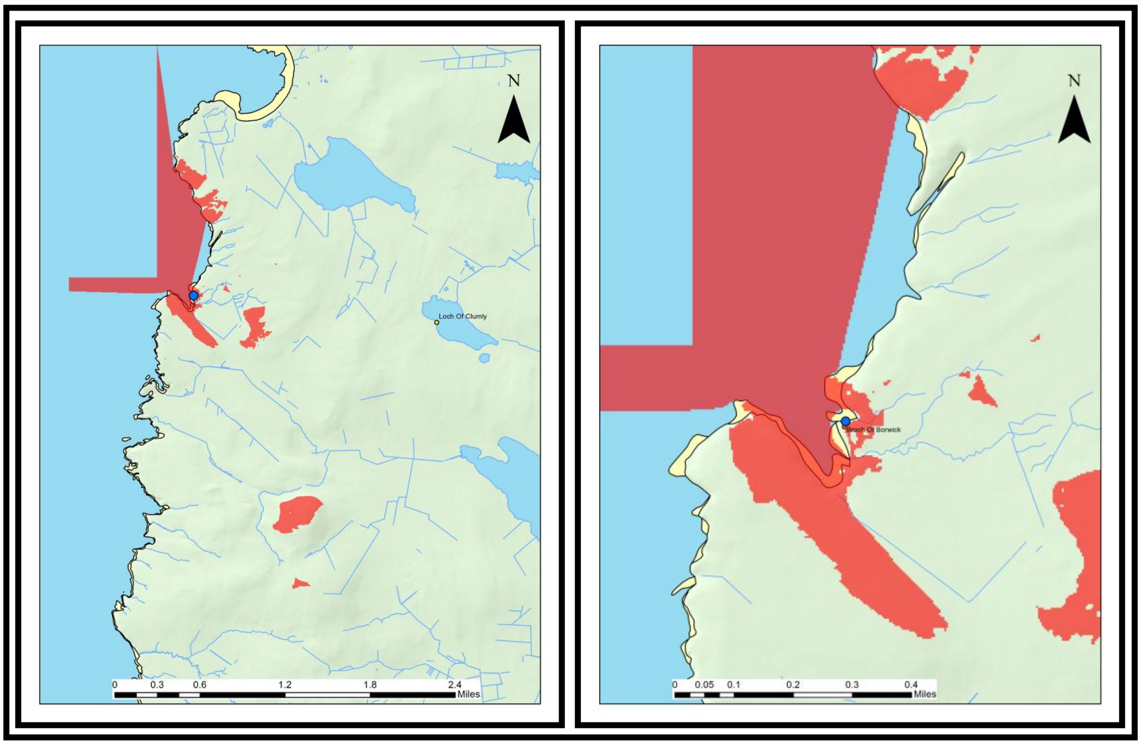


Figure 5.382. Sunrise (08:44 AM) to 13:00 PM around Broch of Borwick on the Winter Solstice (21st December). Red areas denote areas of shadow.

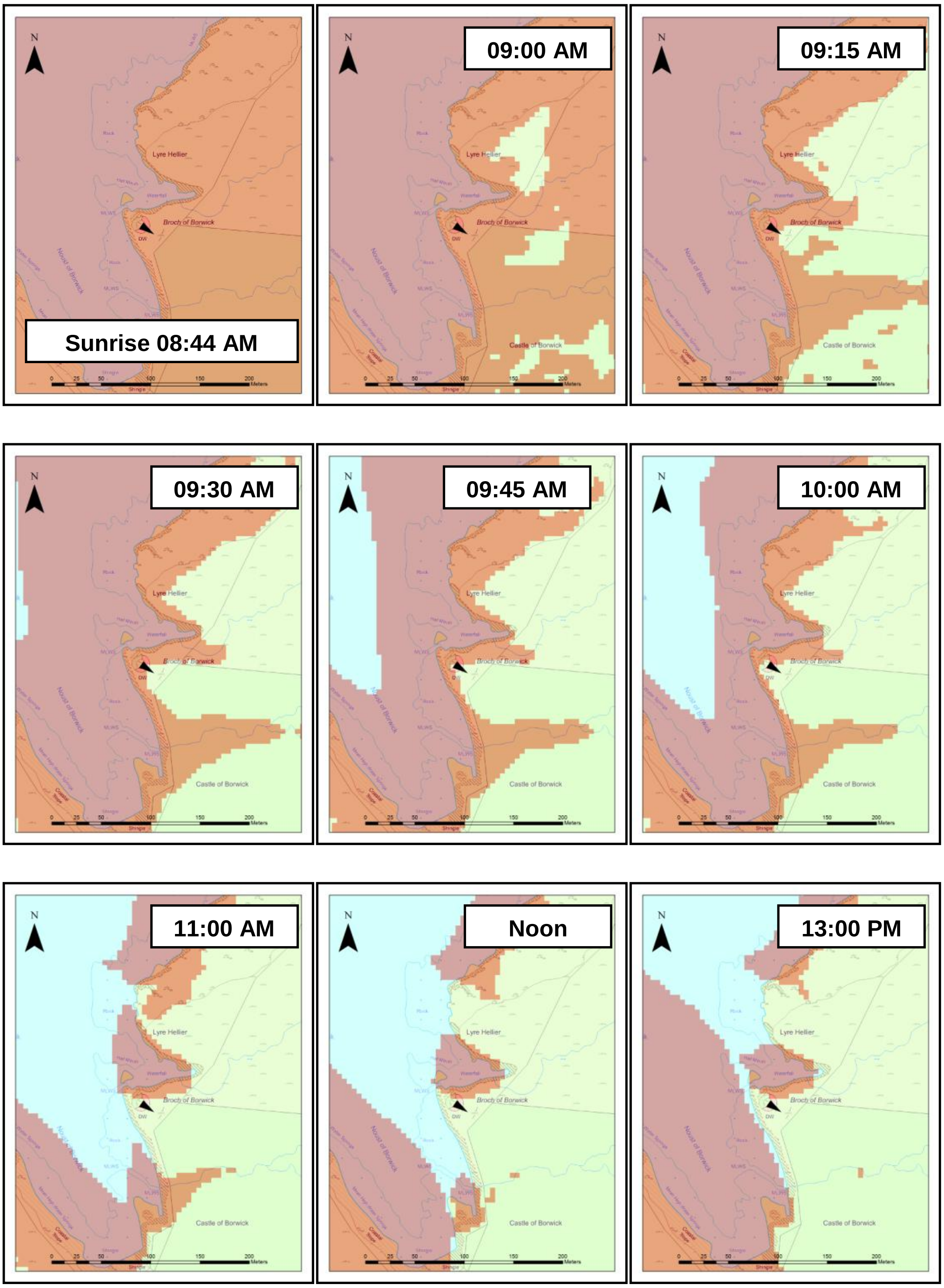


Figure 5.383.13:30 PM to Sunset (14:47 PM) around Broch of Borwick on the Winter Solstice (21st December). Red areas denote areas of shadow.

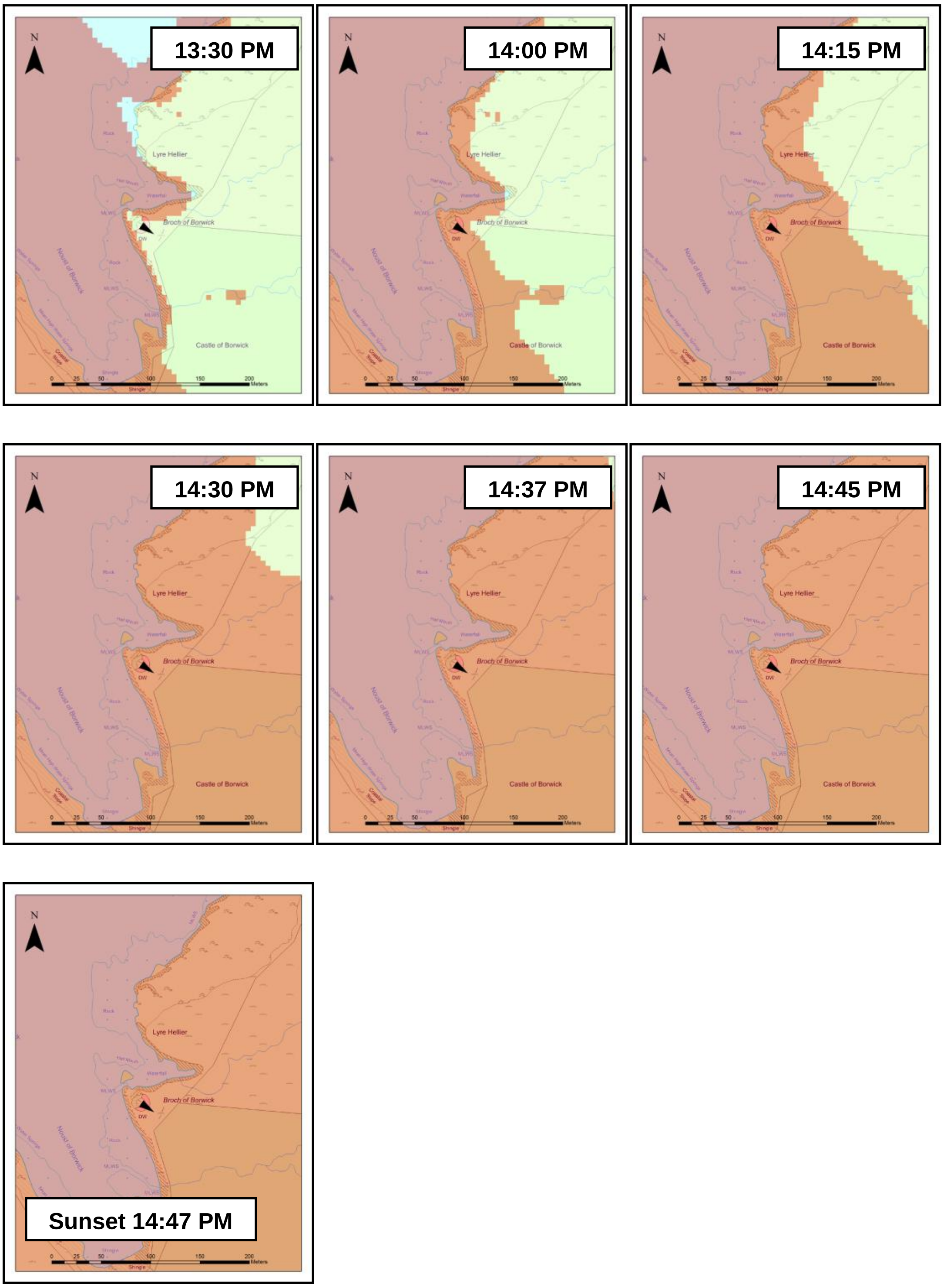


Figure 5.384. Sunrise (05:48 AM) to 11:00 AM around Broch of Borwick on the Spring Equinox (21st March). Red areas denote areas of shadow.

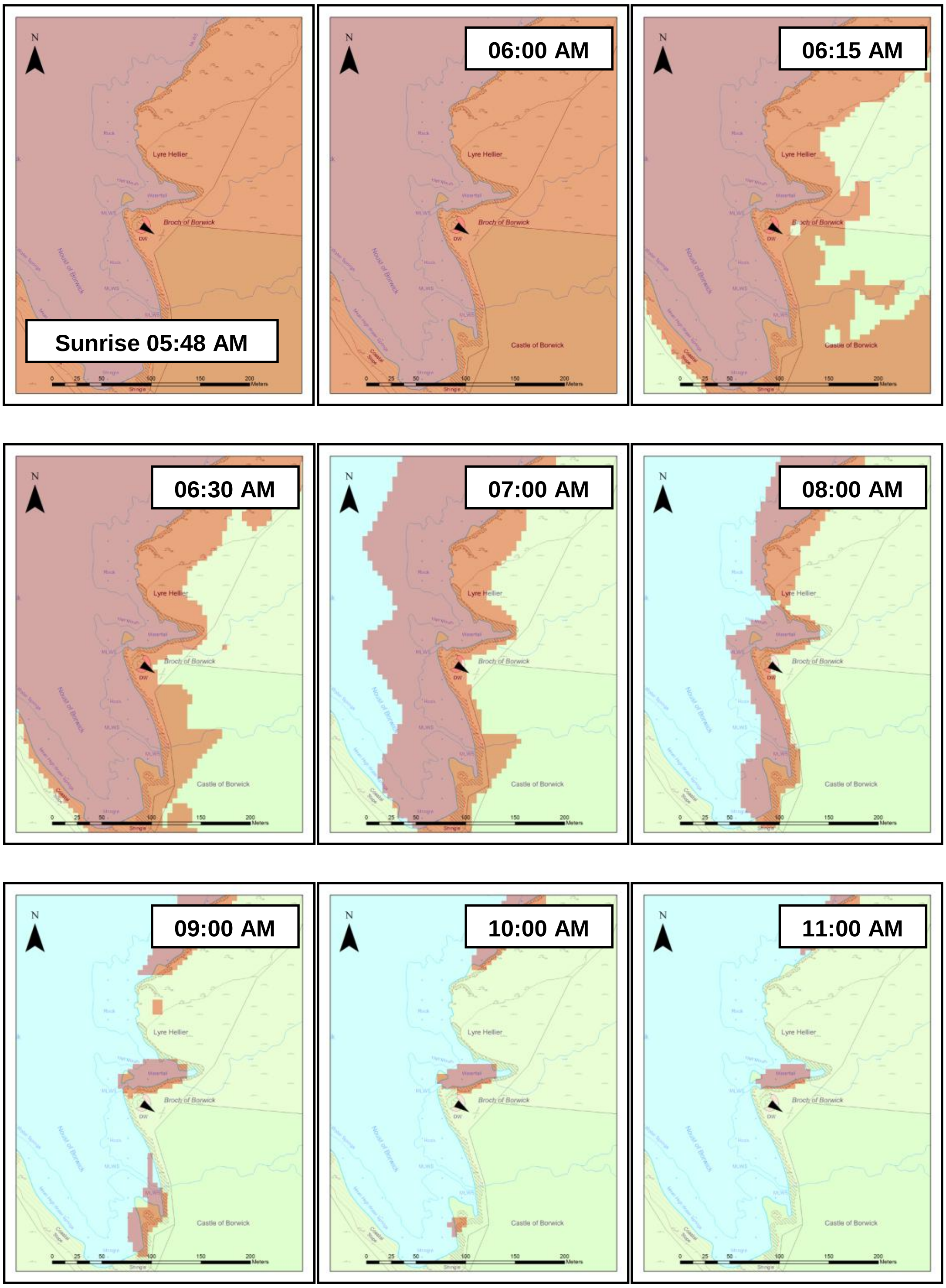


Figure 5.385. Noon to Sunset (18:02:15 PM) around Broch of Borwick on the Spring Equinox (21st March). Red areas denote areas of shadow.

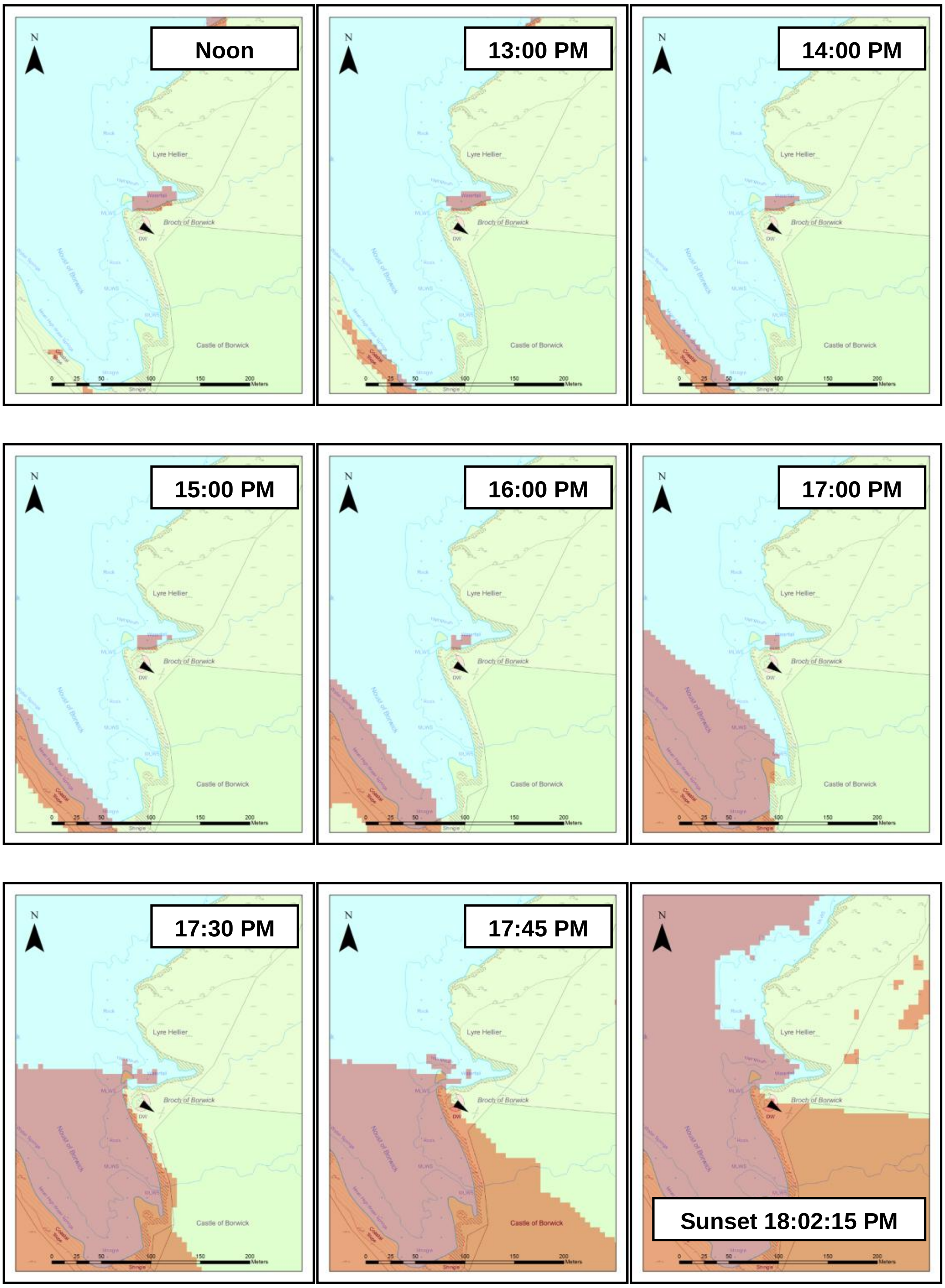


Figure 5.386. Sunrise (02:36:40 AM) to 09:00 AM around Broch of Borwick on the Summer Solstice (21st June). Red areas denote areas of shadow.

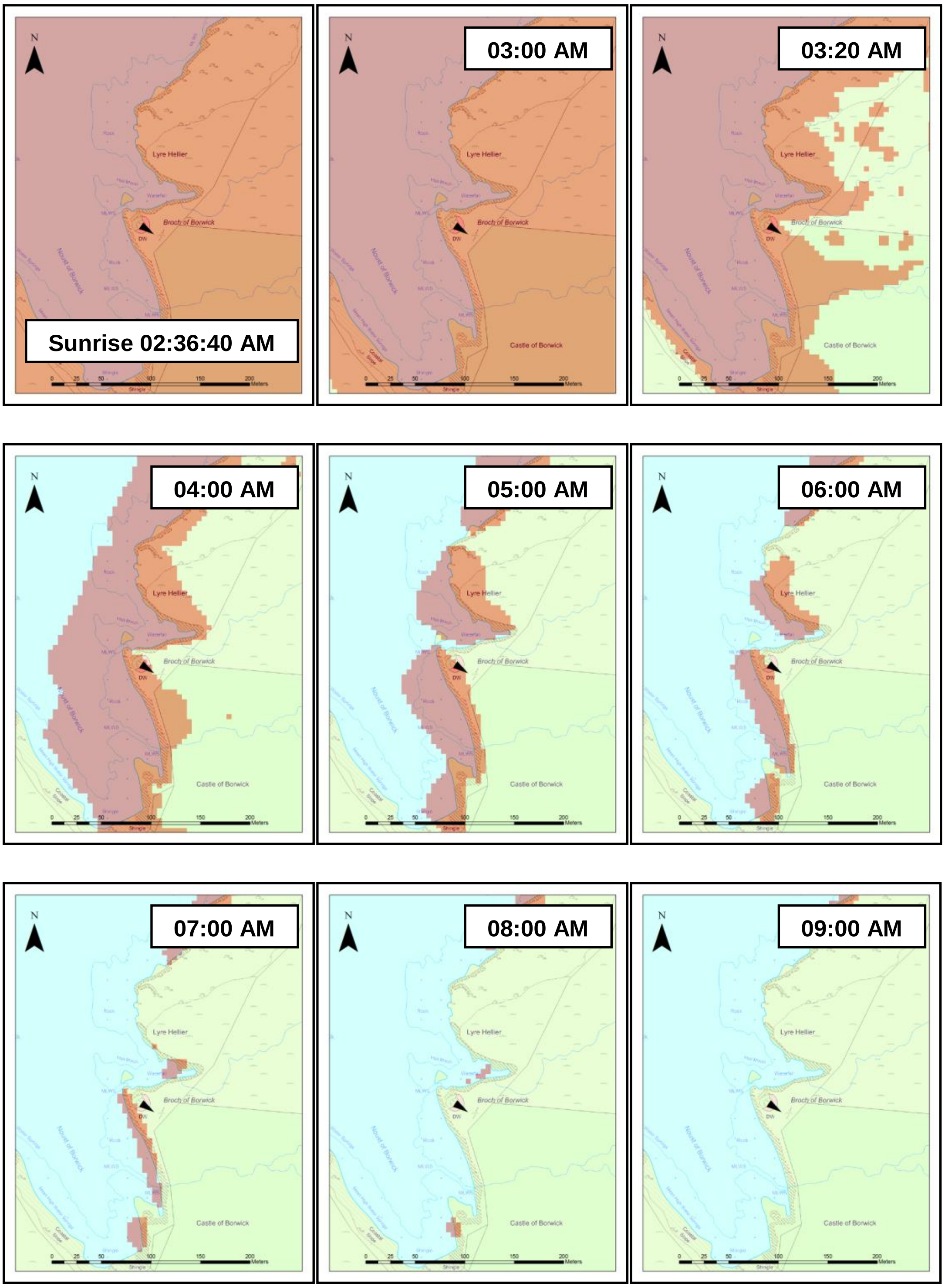


Figure 5.387. 10:00 AM to 18:00 PM around Broch of Borwick on the Summer Solstice (21st June). Red areas denote areas of shadow.

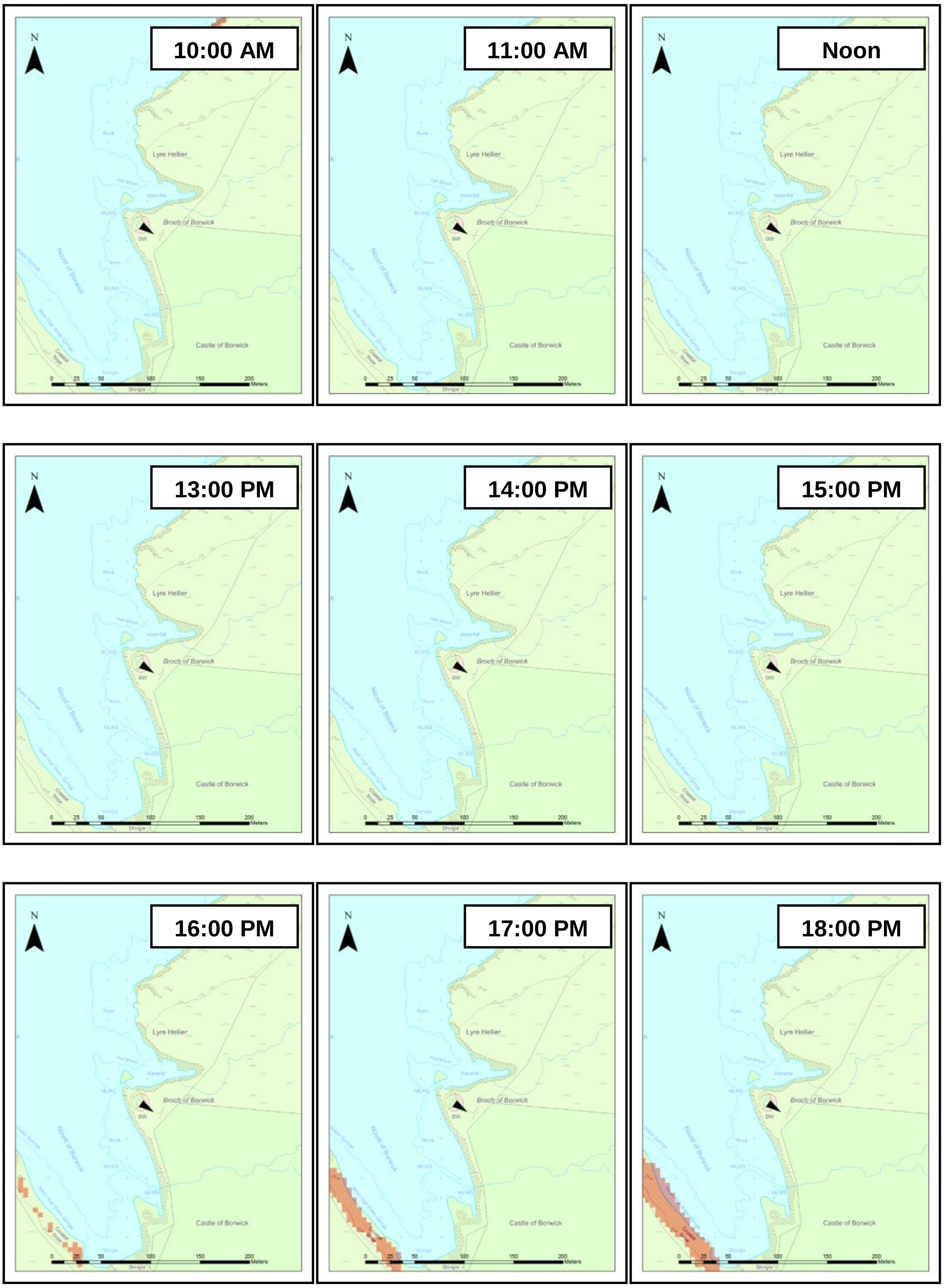
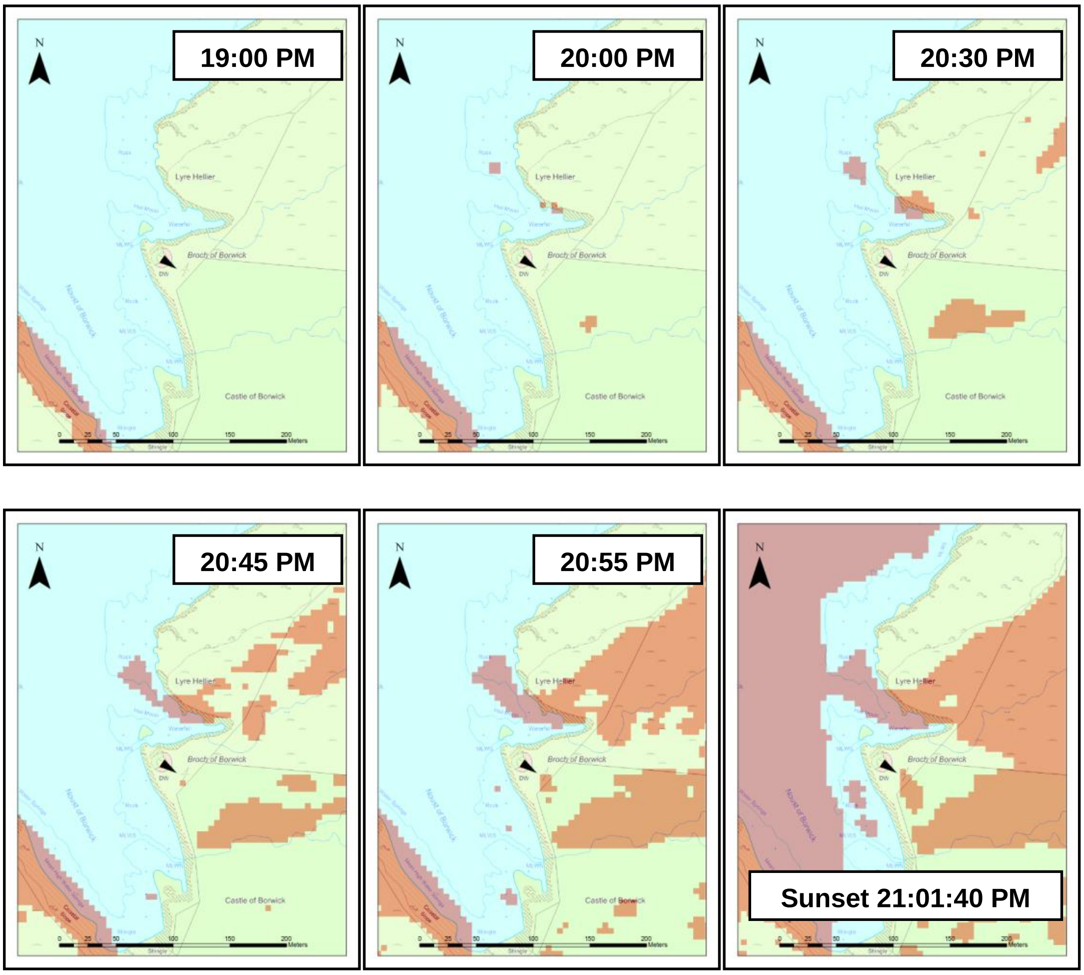


Figure 5.388. 19:00 PM to Sunset (21:01:40 PM) around Broch of Borwick on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 15: Munkerhoose

Canmore ID: 2867

Entrance: SE

The Broch and its Landscape Context

Munkerhoose (Figures 5.389 & 5.390), an extensive Iron Age site located on a sea cliff near the church of St. Boniface in Papa Westray, has been thoroughly investigated by archaeologists (Dalland 1998; Moore and Wilson 1998; Lowe 1998; 1990; 1994; RCAHMS 1946: 184; Rendall 2002). Its broch has little visibility of its own island (Figure 5.391), but has good views towards Westray and excellent views of the sea in general. Any boat travelling up the western seaways of Orkney, perhaps towards Shetland, would have thus been visible, and so again, the sea was probably the object of attention for the inhabitants.

The Winter Solstice – Figures 5.392 and 5.393

Though it is difficult to judge because the remains of the broch lie within the current cliff edge and so the illustrations depict it as in shadow throughout much of the day, we can assume that the broch would have gained light probably about an hour after sunrise, and then retained it until about forty minutes before sunset. Therefore, a western – rather than its eastern – doorway would have been better.

The Equinox (21st March) – Figures 5.394 and 5.395

Again, the broch would have gained direct sunlight about an hour after sunrise, and then retains light until sunset itself. Therefore, a western entrance would have been noticeably more suitable with regards to light.

The Summer Solstice (21st June) Figures 5.396, 5.397 and 5.398

The broch gains light within twenty minutes after sunrise, and it and its landscape then retain light until sunset after 21:00 PM. Again, a western entrance would have been better.

Conclusions

Throughout the year, a western entrance would have provided noticeably more light than its SE entrance. However, it may be that this entrance is avoiding the powerful south-westerly winds which are notorious in the Orcadian Islands.

Figure 5.389. Eastern View towards Munkerhoose, Papa Westray. Author’s Photo.

Figure 5.390. View towards the south-west from Munkerhoose. Author's Photo.

Figure 5.391. Multiple Viewsheds of Munkerhoose

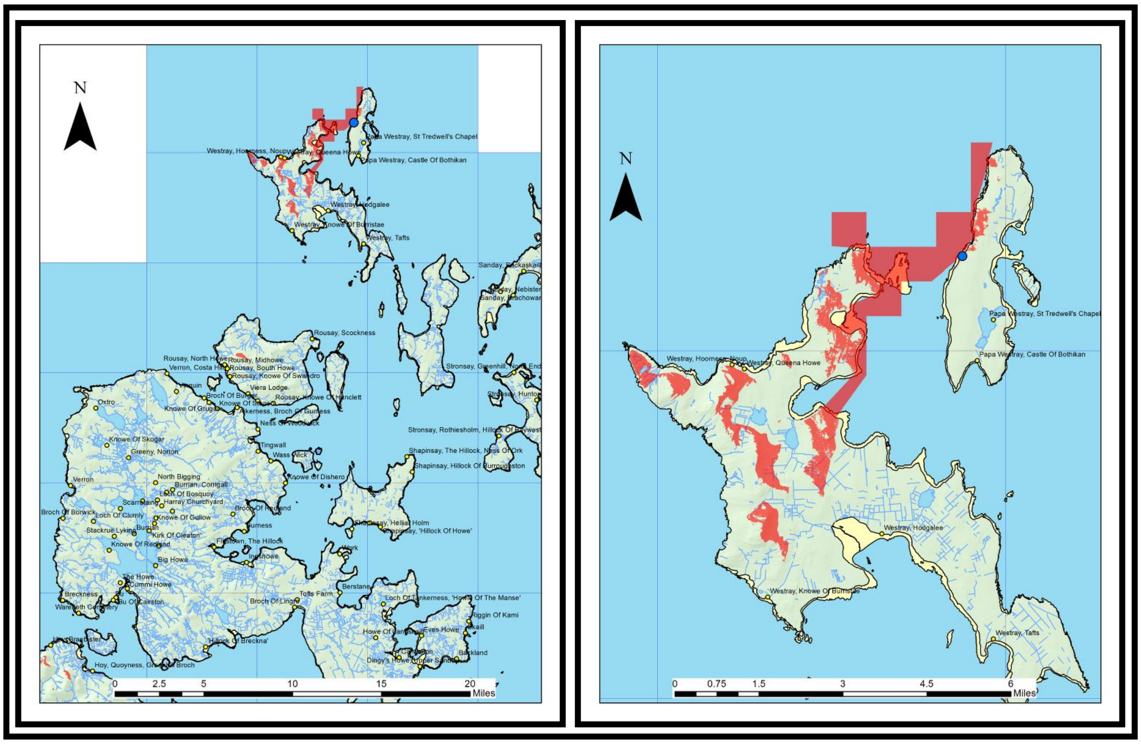


Figure 5.392. Sunrise (08:44 AM) to 13:00 PM around Munkerhoose on the Winter Solstice (21st December). Red areas denote areas of shadow.

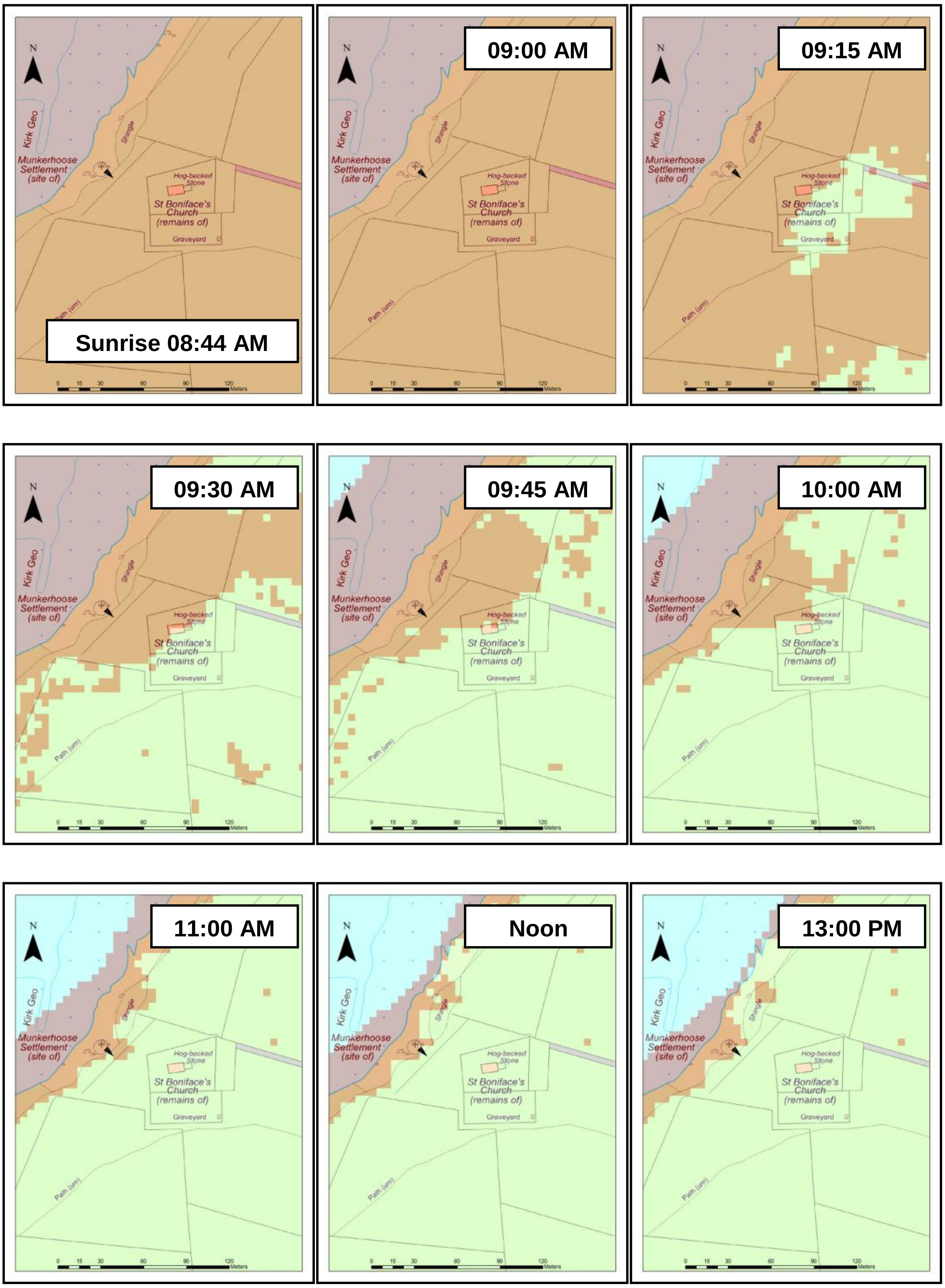


Figure 5.393. 14:00 PM to Sunset (14:47 PM) around Munkerhoose on the Winter Solstice (21st December). Red areas denote areas of shadow.

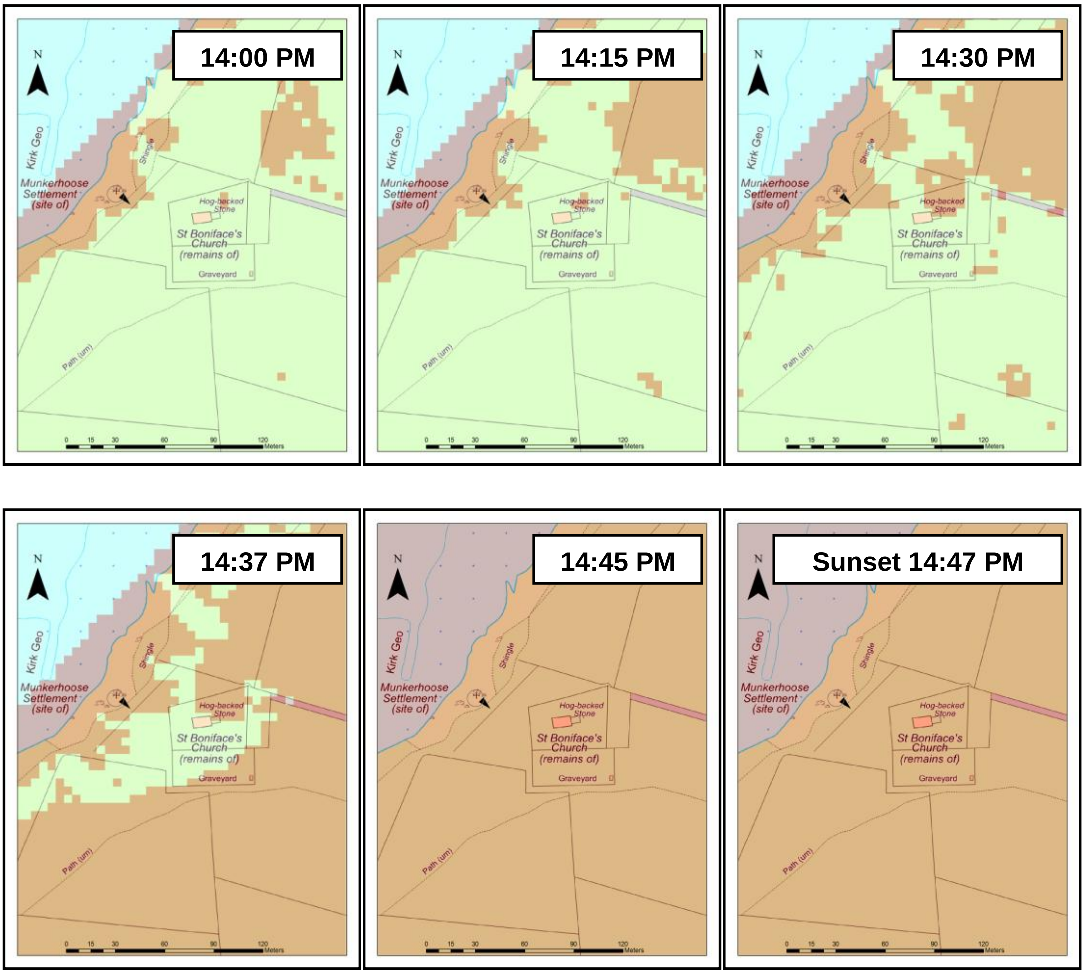


Figure 5.394. Sunrise (05:48 AM) to 11:00 AM around Munkerhoose on the Spring Equinox (21st March). Red areas denote areas of shadow.

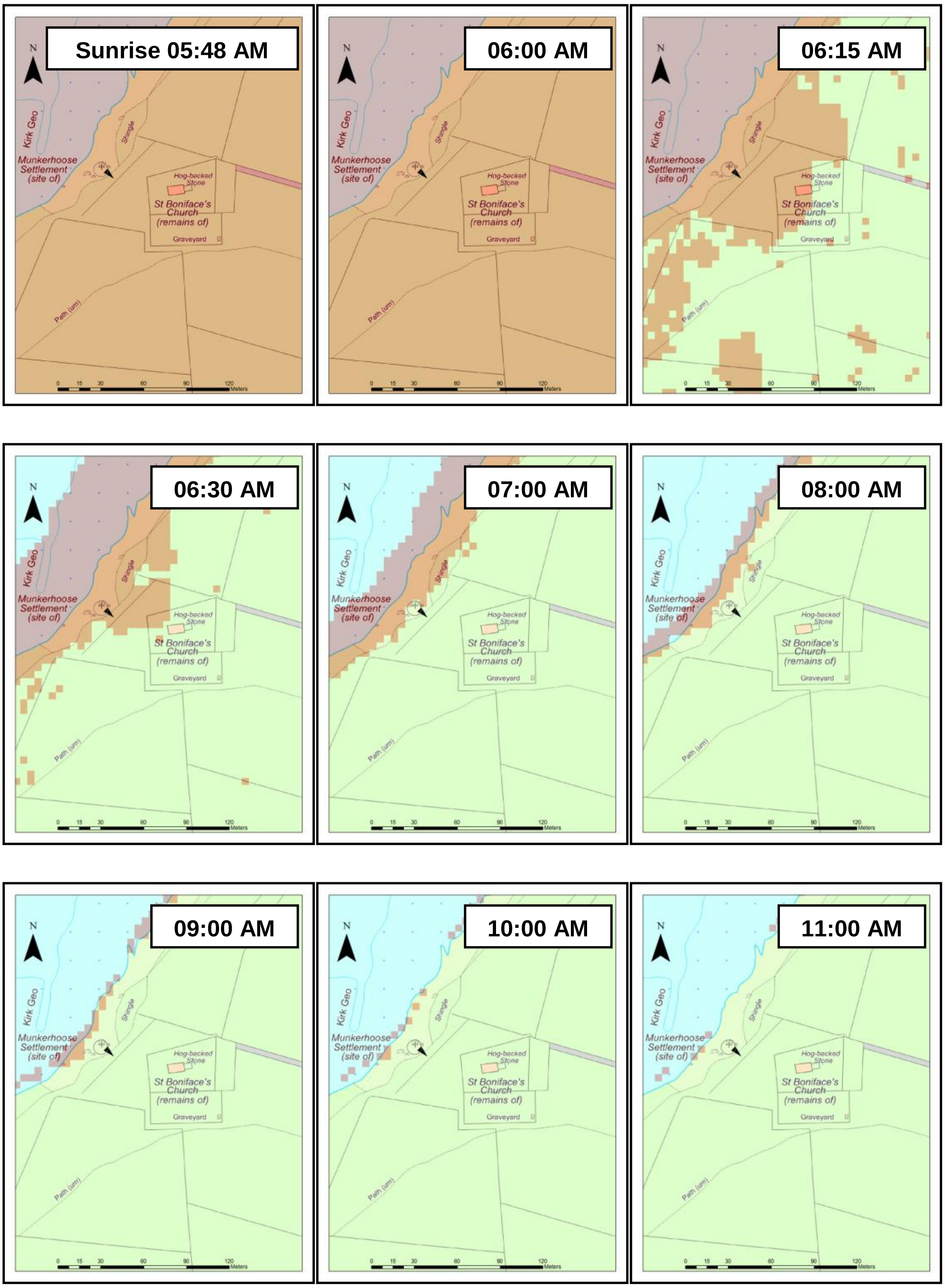


Figure 5.395. Noon to Sunset (18:02:15 PM) around Munkerhoose on the Spring Equinox (21st March). Red areas denote areas of shadow.

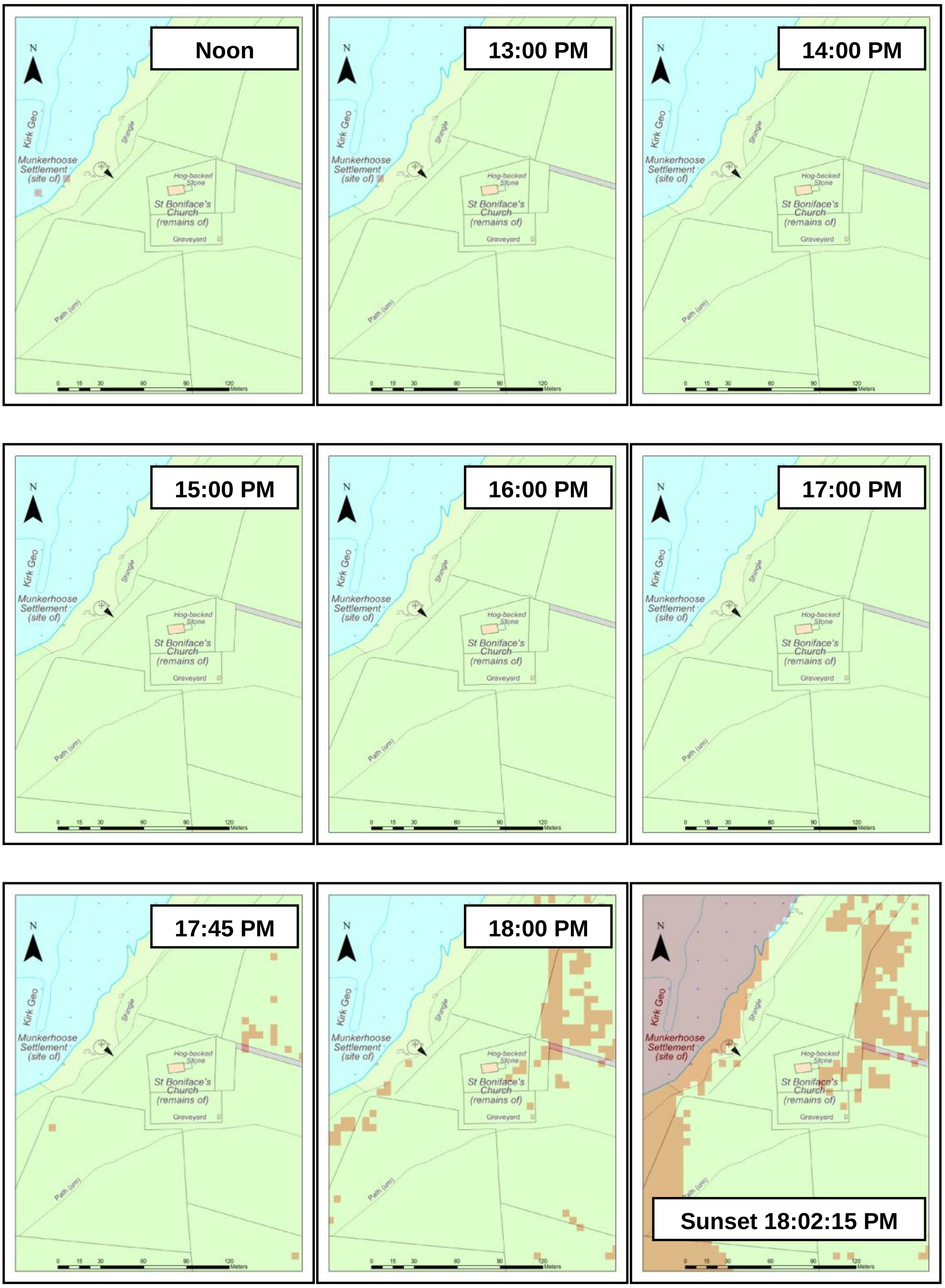


Figure 5.396. Sunrise (02:36:40 AM) to 09:00 AM around Munkerhoose on the Summer Solstice (21st June). Red areas denote areas of shadow.

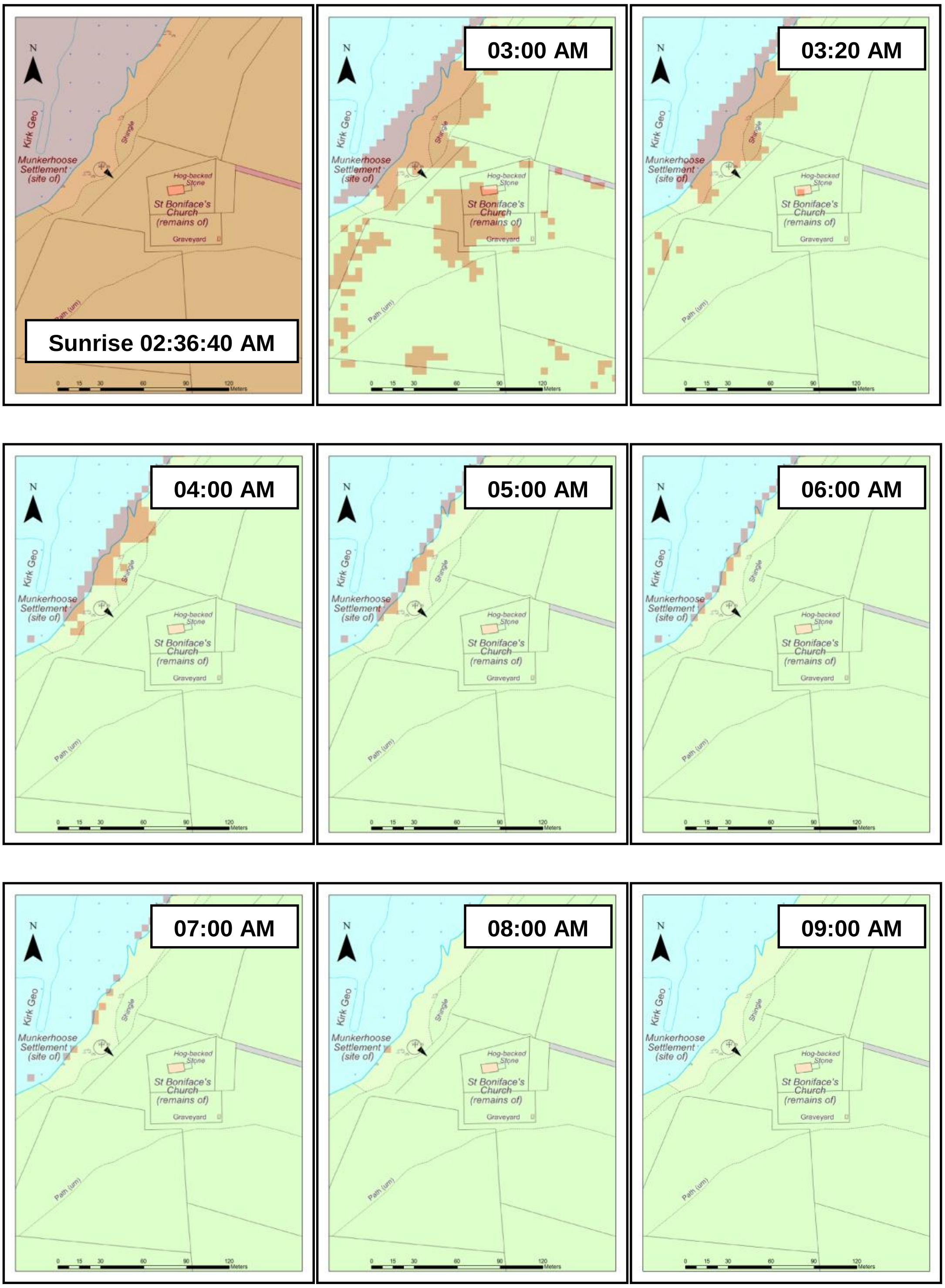


Figure 5.397. 10:00 AM to 18:00 PM around Munkerhoose on the Summer Solstice (21st June). Red areas denote areas of shadow.

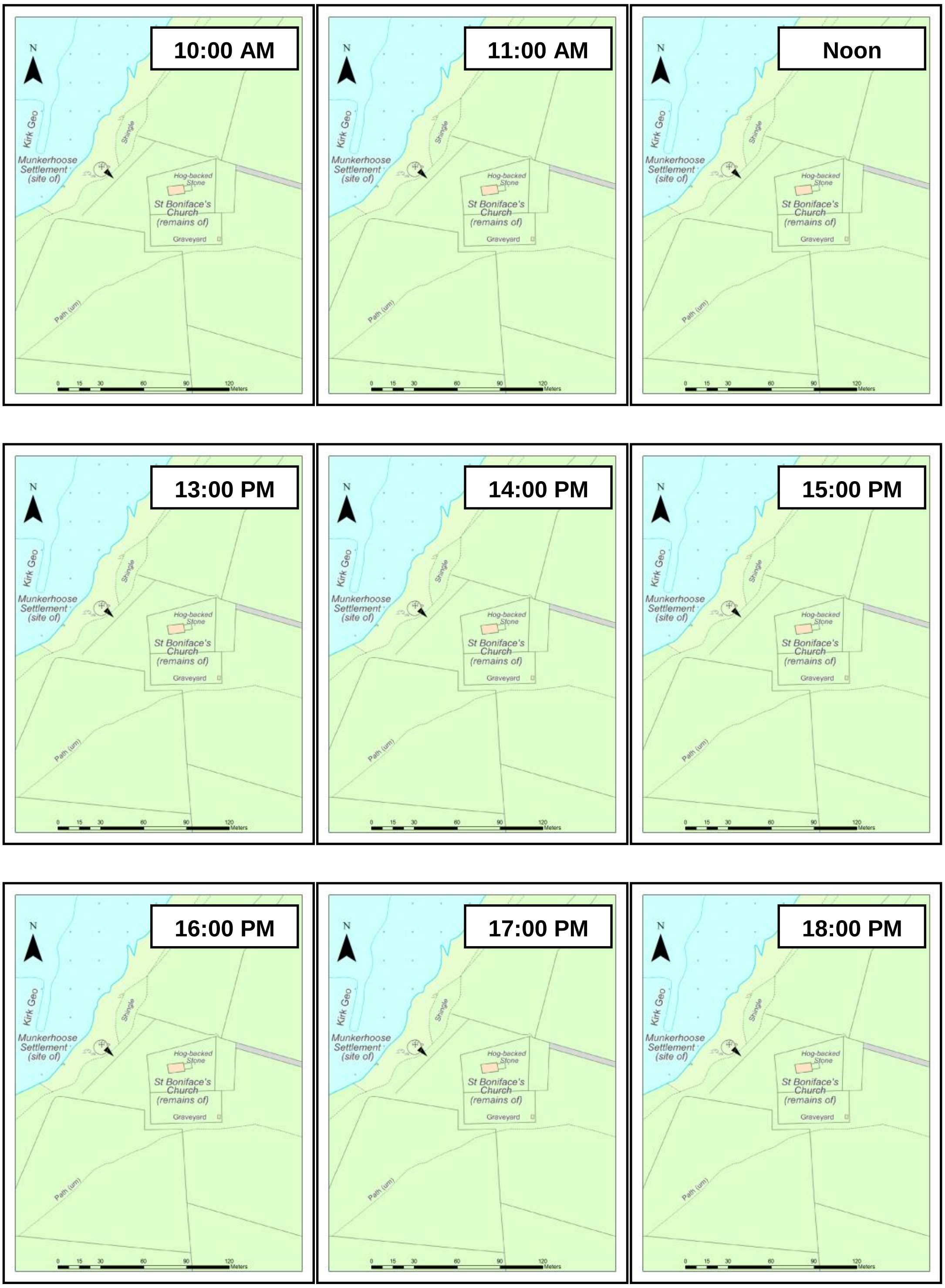
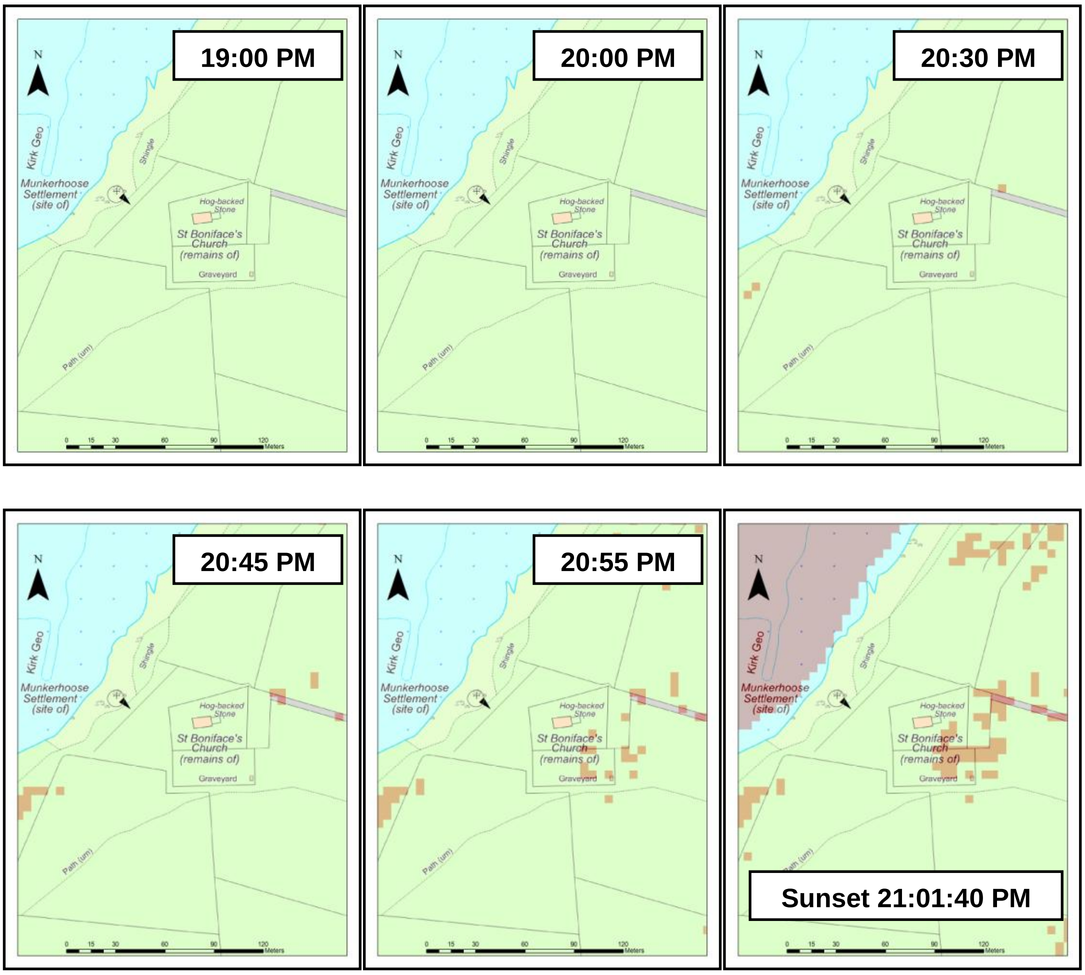


Figure 5.398. 19:00 PM to Sunset (21:01:40 PM) around Munkerhoose on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 16: Howie of the Manse

Canmore ID: 2989

Entrance: SE

The Broch and its Landscape Context

This unexcavated broch (RCAHMS 1946: 243), located on a small neck of dry land which juts into the south end of the Loch of Tankerness, has a full view of this loch, as well as the land immediately surrounding it, though little view of the rest of Mainland Orkney (Figure 5.399). Interesting, it has little to no view of the sea, unlike so many other brochs in Orkney, though its relationship with the water body it is located within is obviously strong.

The Winter Solstice – Figures 5.400 and 5.401

The broch gains direct sunlight within the first fifteen minutes of the day, and it and its landscape retain it until between 14:30 PM and 14:37 PM, about fifteen minutes before sunset. Therefore, the SE entrance is well suited to this time of year, though the difference between an east and west entrance would have been barely noticeable with regards to light.

The Equinox (21st March) – Figures 5.402 and 5.403

The broch gains direct sunlight within ten minutes after sunrise, retaining it until the last fifteen minutes before sunset. Its eastern entrance is thus marginally more beneficial during the spring and autumn.

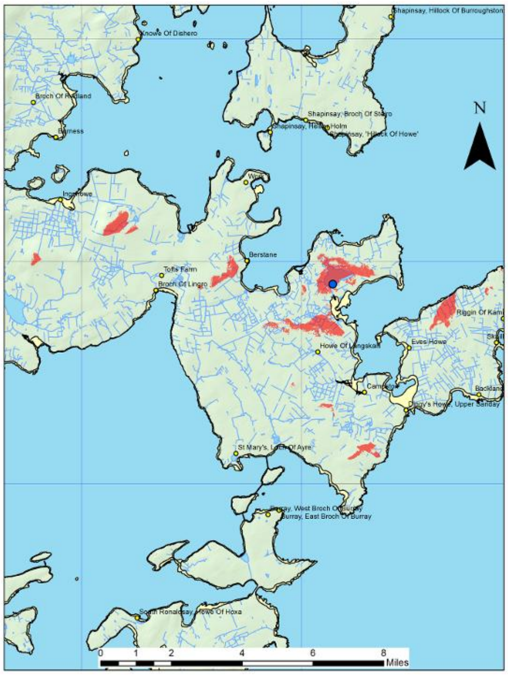
The Summer Solstice (21st June) – Figures 5.404, 5.405 and 5.406

Direct sunlight is gained within twenty minutes after sunrise, with the broch retaining it until the last twenty minutes before sunset at least.

Conclusions

Throughout much of the year, an eastern or western entrance would have gained equal amounts of direct sunlight, though an easterly entrance would have probably gained slight more sunlight during spring and autumn. This entrance, facing the landward side of the small peninsula the broch is located upon, would have also been the most easily accessible.

Figure 5.399. Viewsheds and Photograph of Howie of the Manse.



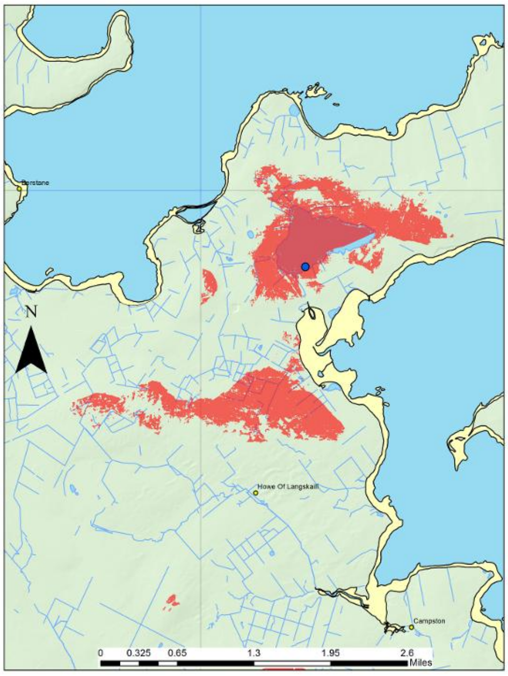


Figure 5.400. Sunrise (08:44 AM) to 13:00 PM around Howie of the Manse on the Winter Solstice (21st December). Red areas denote areas of shadow.

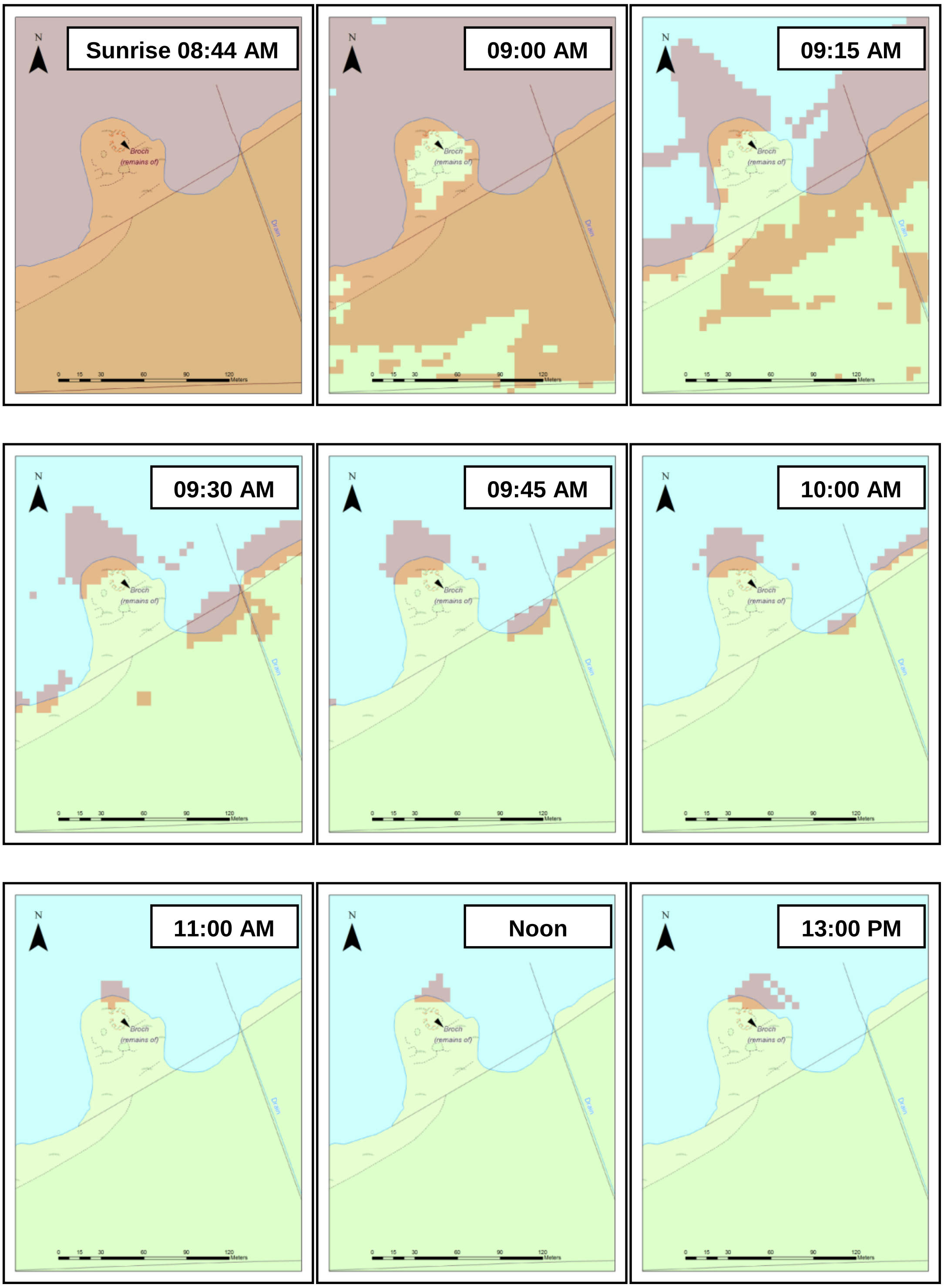


Figure 5.401. 13:30 PM to Sunset (14:47 PM) around Howie of the Manse on the Winter Solstice (21st December). Red areas denote areas of shadow.

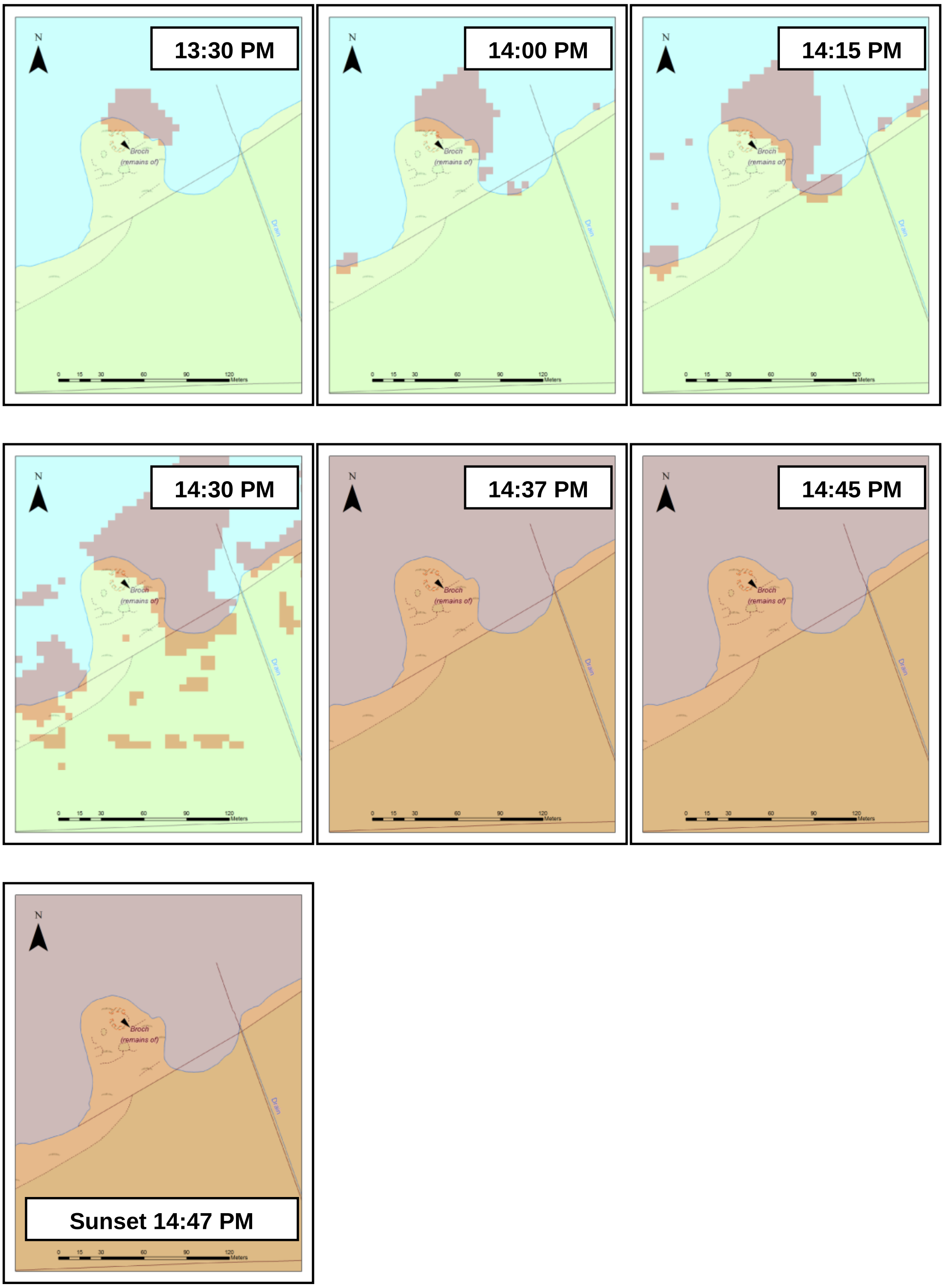


Figure 5.402. Sunrise (05:48 AM) to 11:00 AM around Howie of the Manse on the Spring Equinox (21st March). Red areas denote areas of shadow.

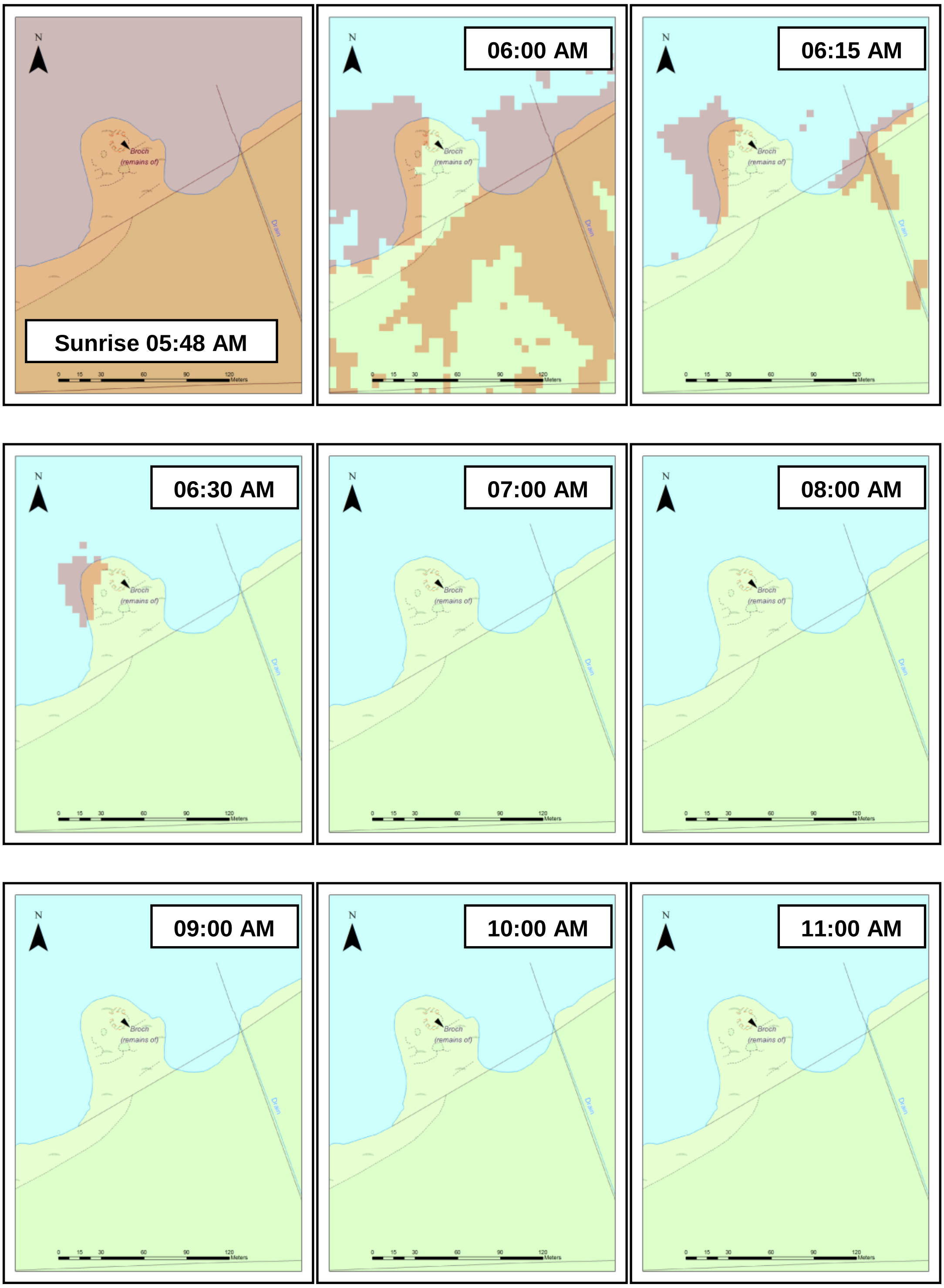


Figure 5.403. Noon to Sunset (18:02:15 PM) around Howie of the Manse on the Spring Equinox (21st March). Red areas denote areas of shadow.

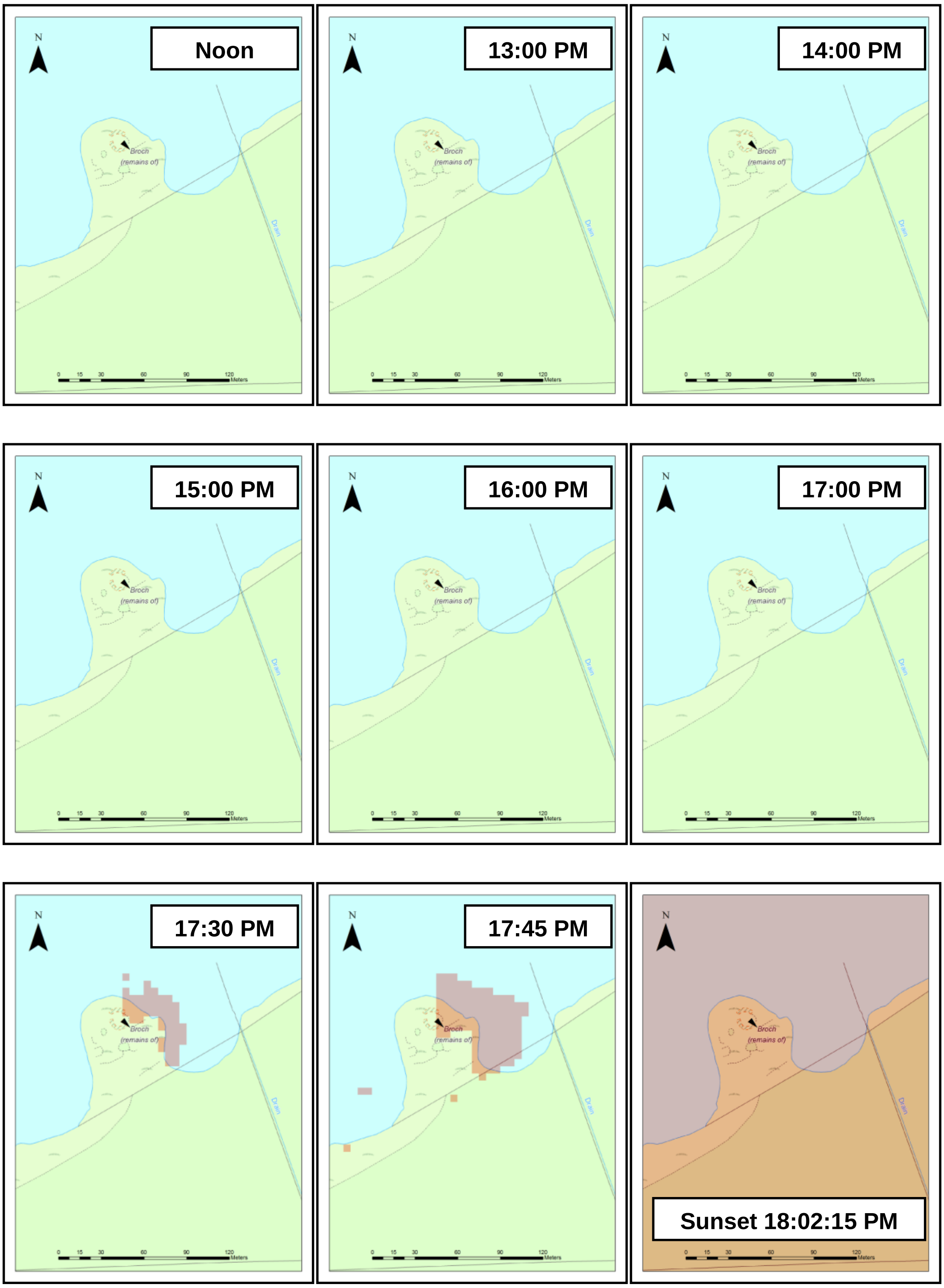


Figure 5.404. Sunrise (02:36:40 AM) to 09:00 AM around Howie of the Manse on the Summer Solstice (21st June). Red areas denote areas of shadow.

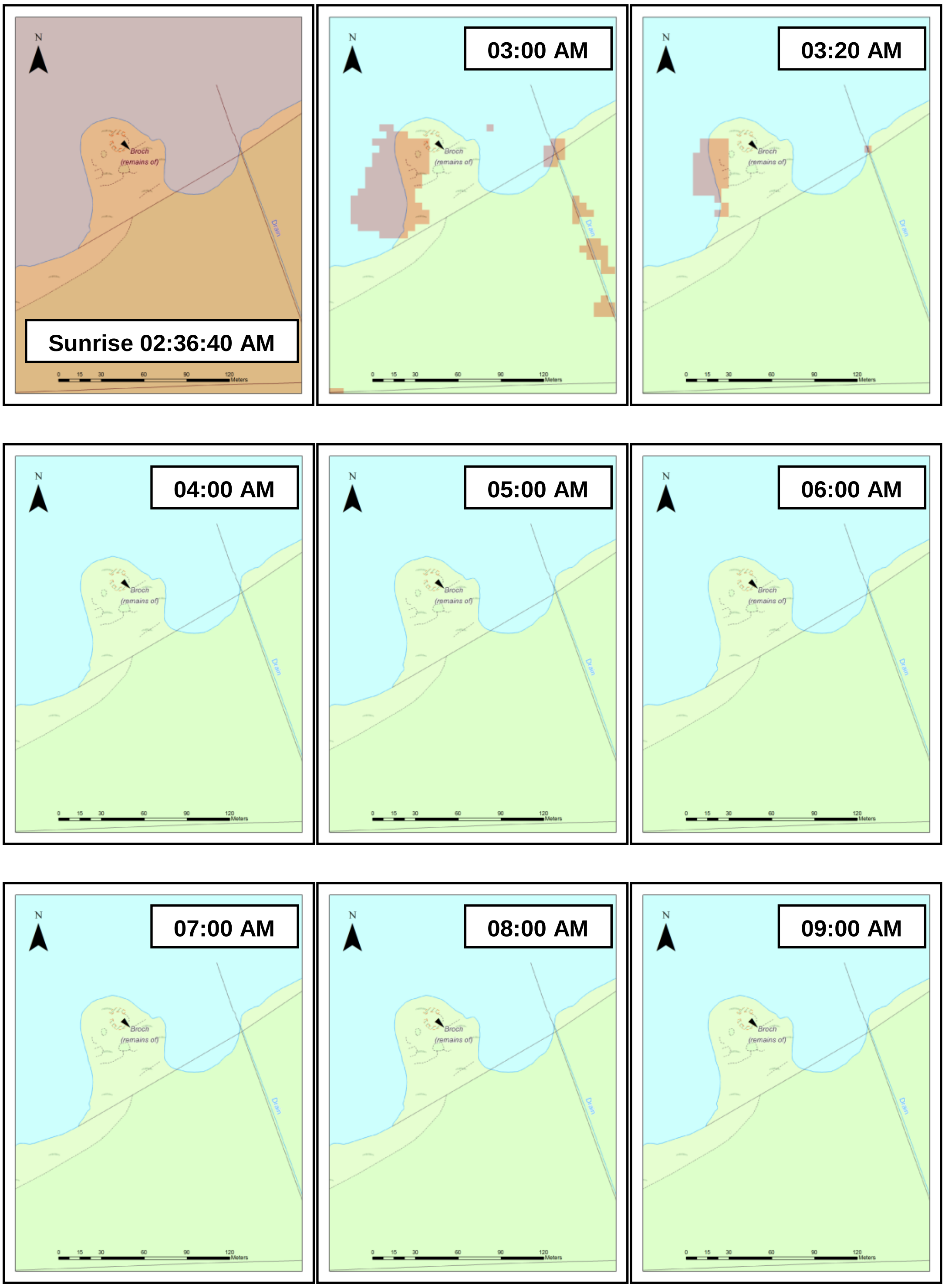


Figure 5.405. 10:00 AM to 18:00 PM around Howie of the Manse on the Summer Solstice (21st June). Red areas denote areas of shadow.

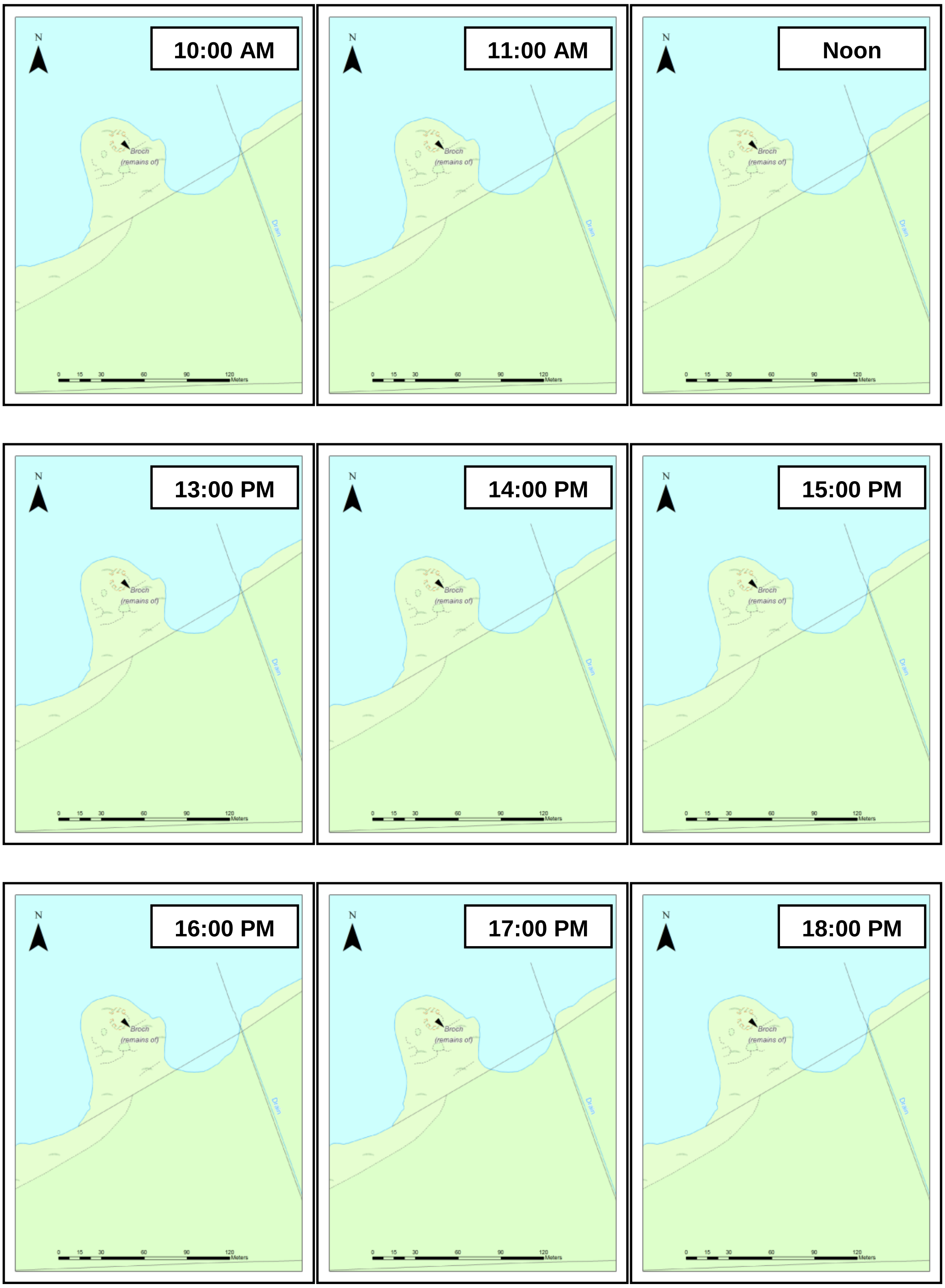
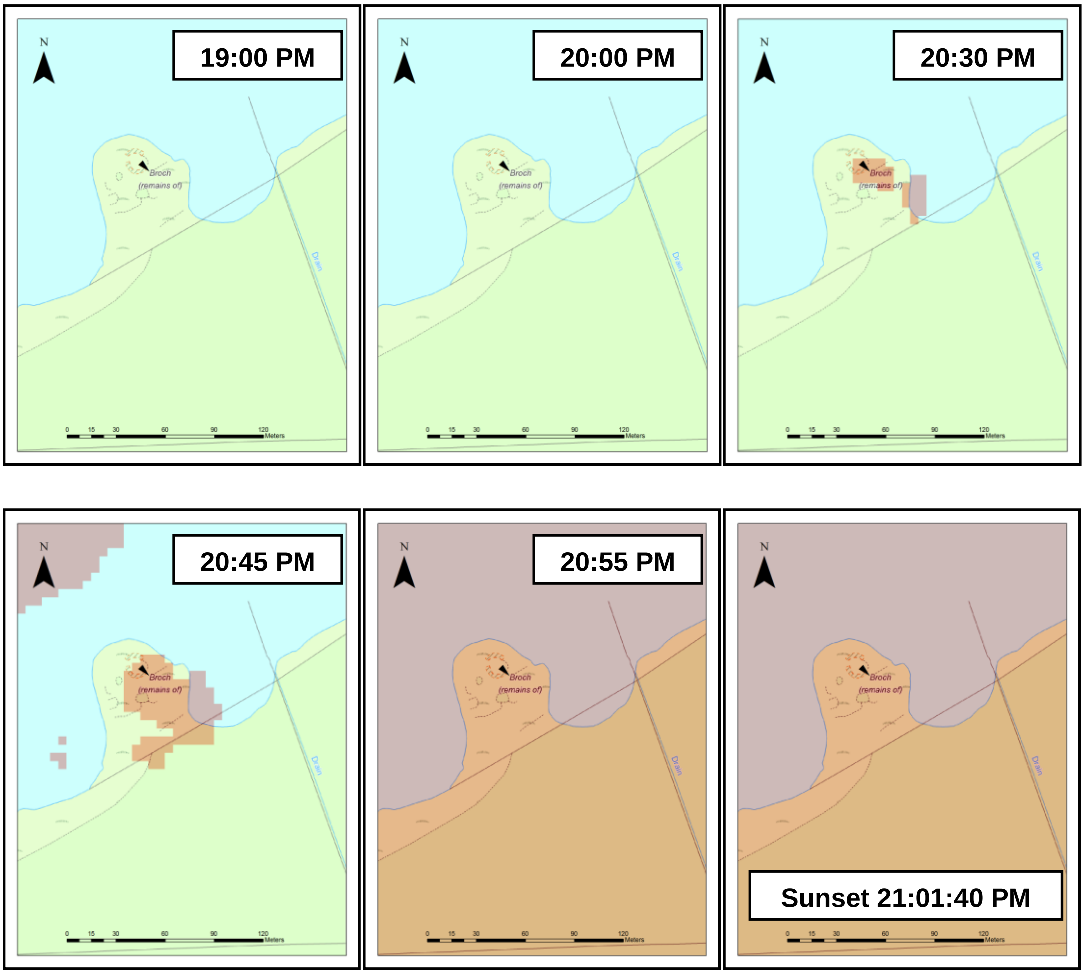


Figure 5.406. 19:00 PM to Sunset (21:01:40 PM) around Howie of the Manse on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 17: The Howe

Canmore ID: 1731

Entrance: SE

The Broch and its Landscape Context

The Howe (Figure 5.407) is one of the most complex and intensely studied brochs in Scotland. Indeed, excavations between 1978 and 1982 (Ballin-Smith 1994; Carter and Smith 1980; Bell and Haigh 1981; Carter, Haig, Neil and Smith 1984; Hedges and Bell 1980; Hedges, Bell and Neil 1979; Hedges 1983; Smith 1985; cf. MacKie 1998) have revealed a complex sequence of dry stone structures, dating from the Neolithic to the Late Iron Age. It is also perhaps one of the most significantly located brochs in Orkney, for numerous reasons. First, it is positioned at the narrow entrance to the Loch of Stenness (Figure 5.408) – essentially the gateway to Orkney's inner lochs and waterways. It has a full view of the Loch of Stenness and the Loch of Harray further north, as well as much of the northern Mainland and many of the brochs located here too. To the south of The Howe, it has a full view of Hoy Sound, and the western half of Scapa Flow. All in all then, this broch not only possesses good views of the Mainland, while commanding the entry into the interior, but it also has extensive views of important seaways.

The Winter Solstice – Figures 5.409 and 5.410

The broch and its landscape gain direct sunlight five to fifteen minutes after sunrise, and then retain it for much of the day, until just after 14:30, nearly twenty minutes before sunset. Its SE entrance was thus perfect for this time of year.

The Equinox (21st March) – Figures 5.411 and 5.412

The broch gains direct light within ten minutes after sunrise, retaining it until just after 17:45 PM, fifteen minutes before sunset. Again, the eastern entrance would have been marginally more beneficial.

The Summer Solstice (21st June) – Figures 5.413, 5.414 and 5.415

During the summer, the broch receives light about twenty minutes after sunrise, retaining light for the remainder of the day until some time between 20:30 and 20:45 PM, fifteen to twenty-five minutes before sunset.

Conclusions

The broch gains direct sunlight quickly throughout the year, and throughout the year, and in winter especially would have been the most suitable orientation.

Figure 5.407. Ground Plan of Howe.
(After: MacKie 1998: 20; fig. 5).

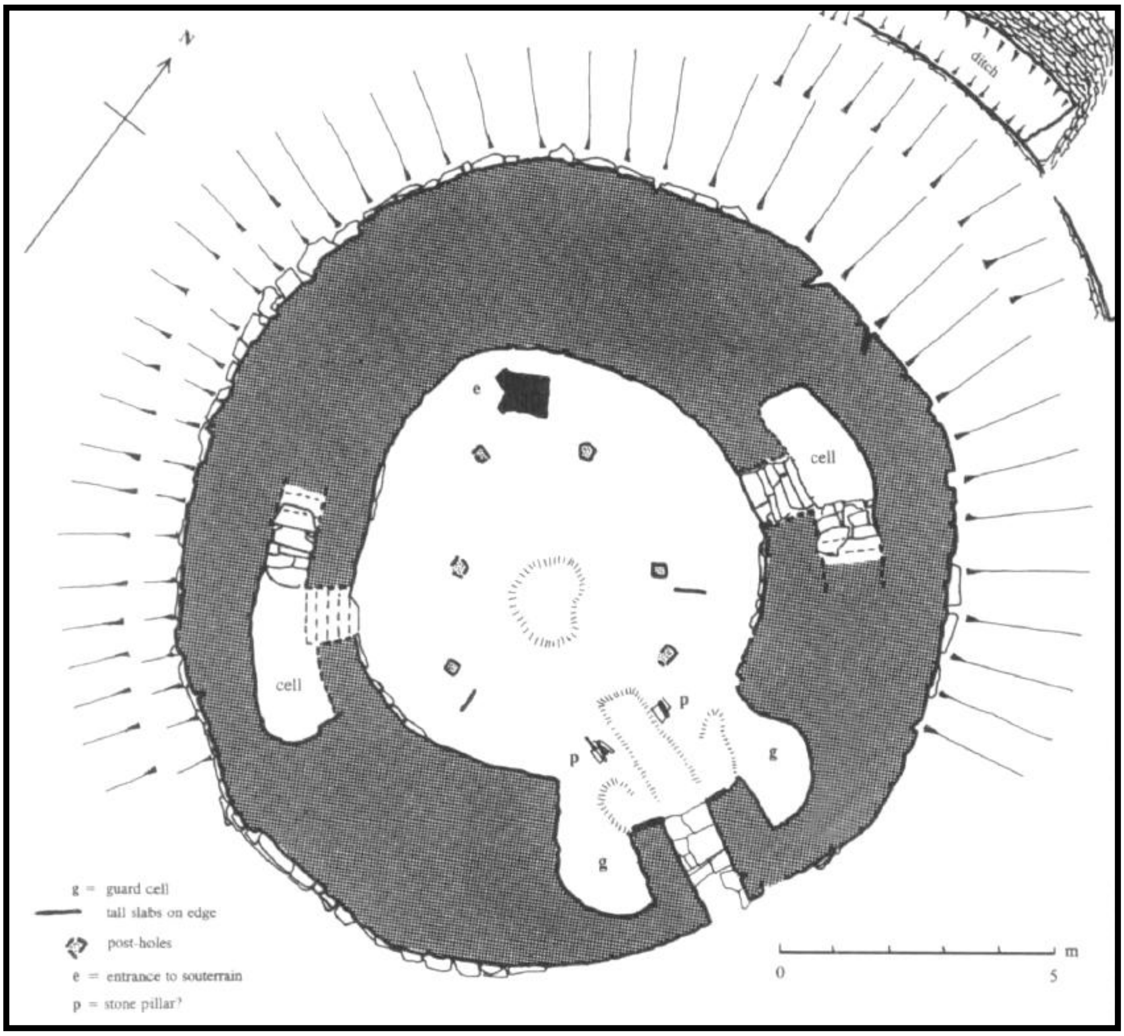


Figure 5.408. Multiple Viewsheds of The Howe

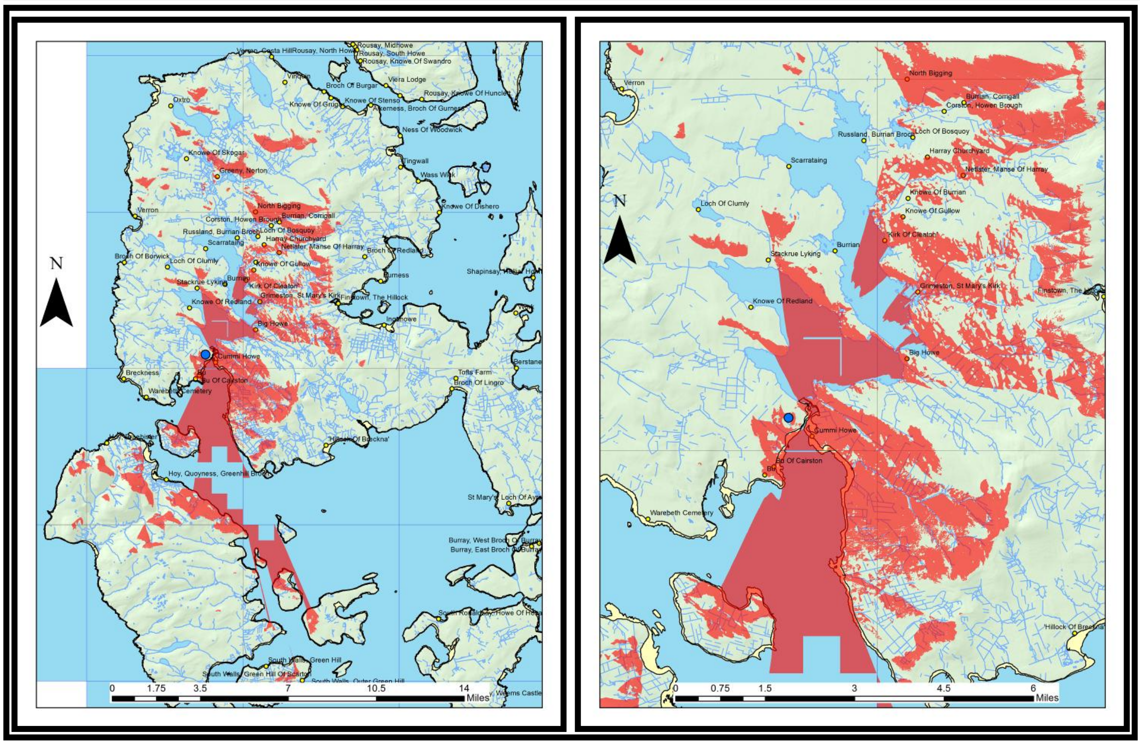


Figure 5.409. Sunrise (08:44 AM) to 13:00 PM around The Howe on the Winter Solstice (21st December). Red areas denote areas of shadow.

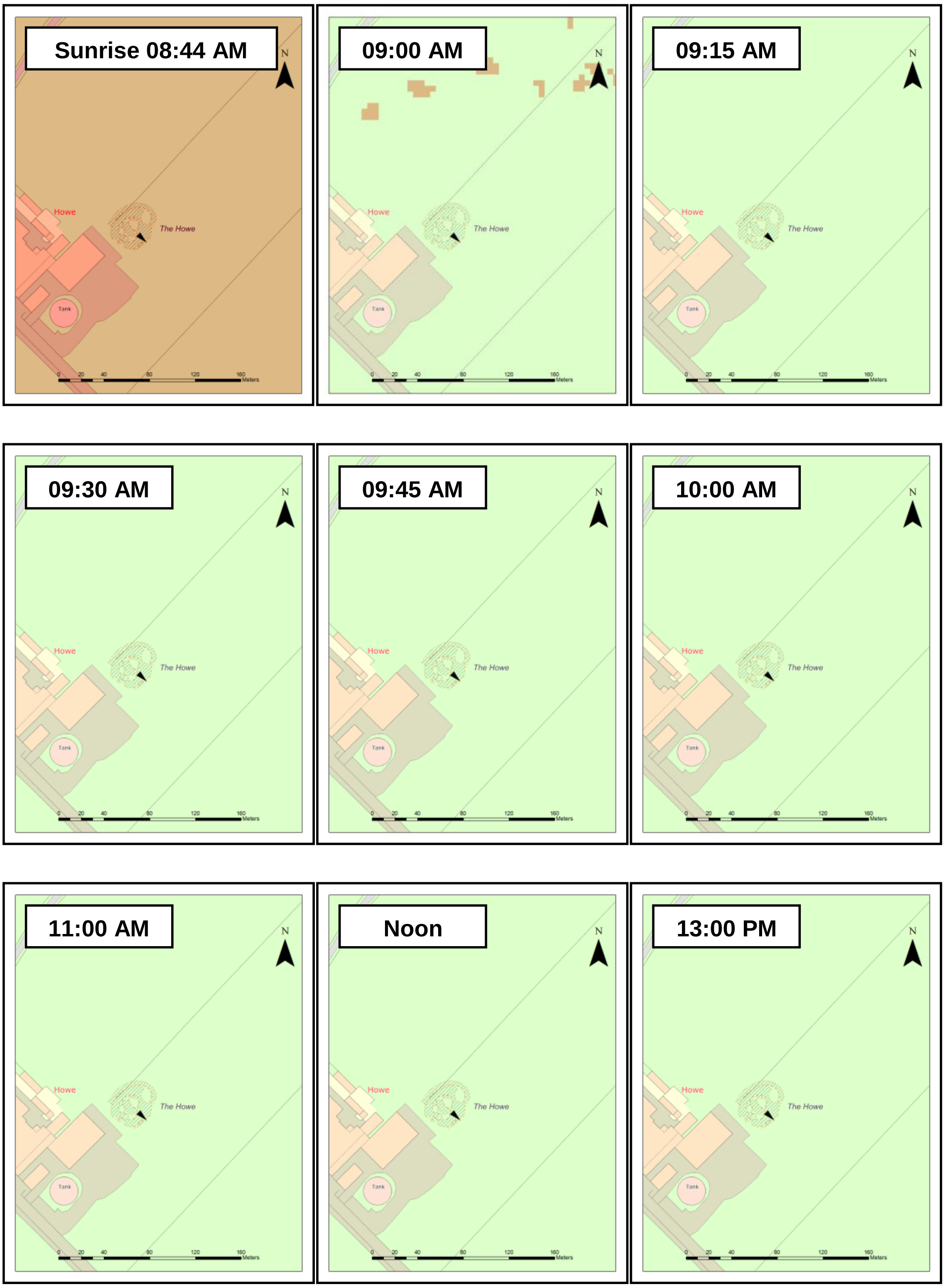


Figure 5.410. 13:30 PM to Sunset (14:47 PM) around The Howe on the Winter Solstice (21st December). Red areas denote areas of shadow.

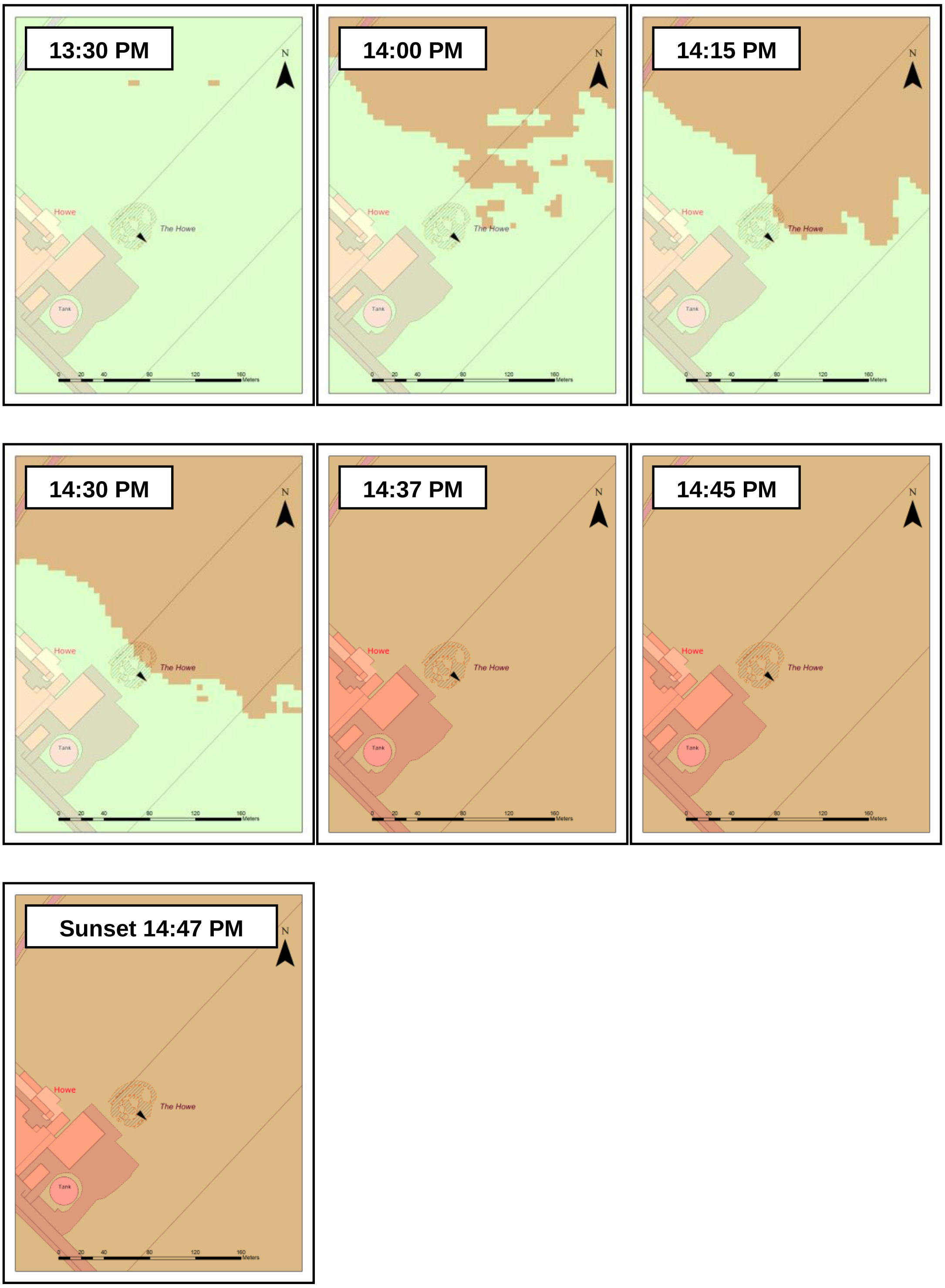


Figure 5.411. Sunset (05:48 AM) to 11:00 AM around The Howe on the Spring Equinox (21st March). Red areas denote areas of shadow.

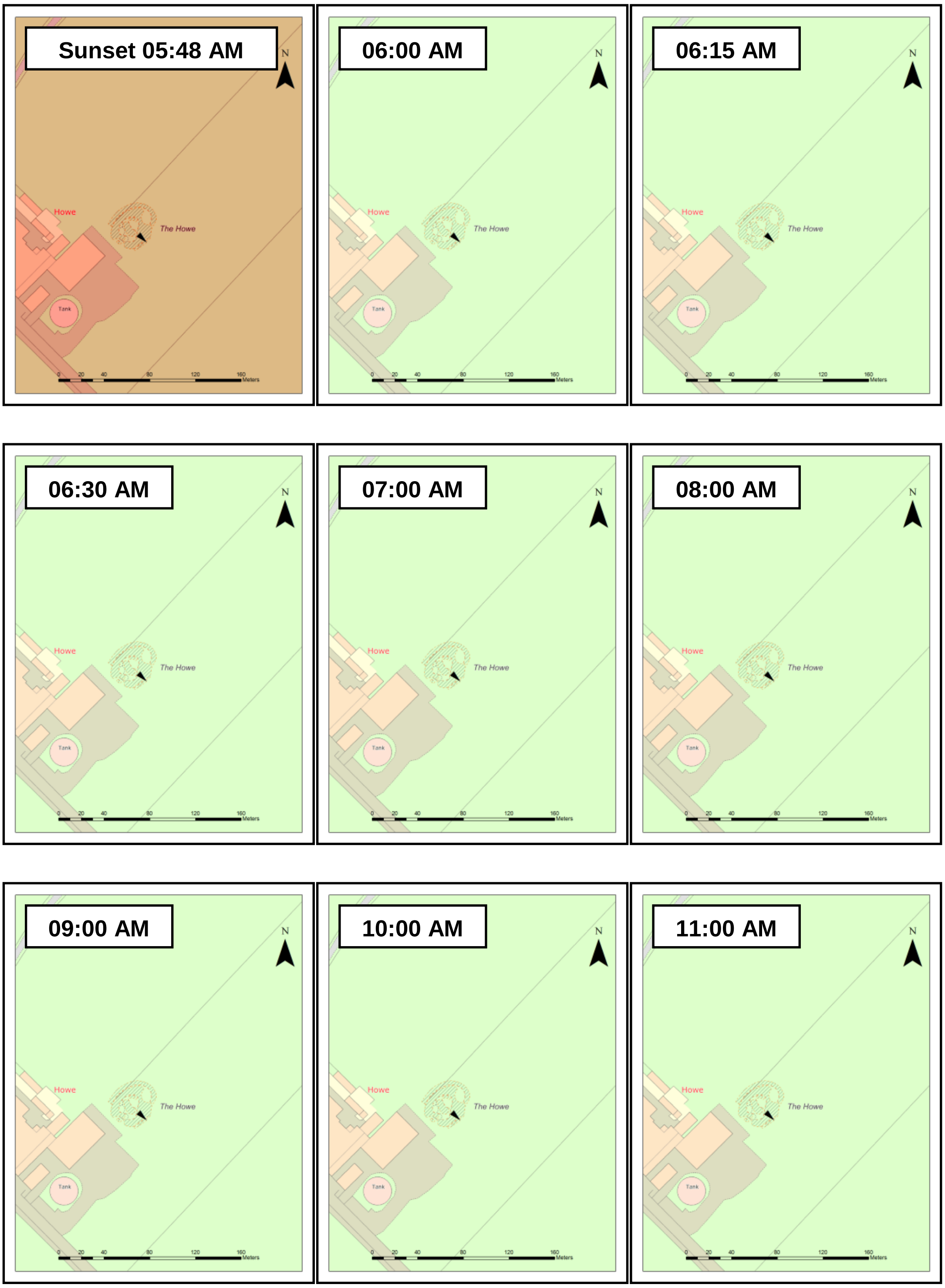


Figure 5.412. Noon to Sunset (18:02:15 PM) around The Howe on the Spring Equinox (21st March). Red areas denote areas of shadow.

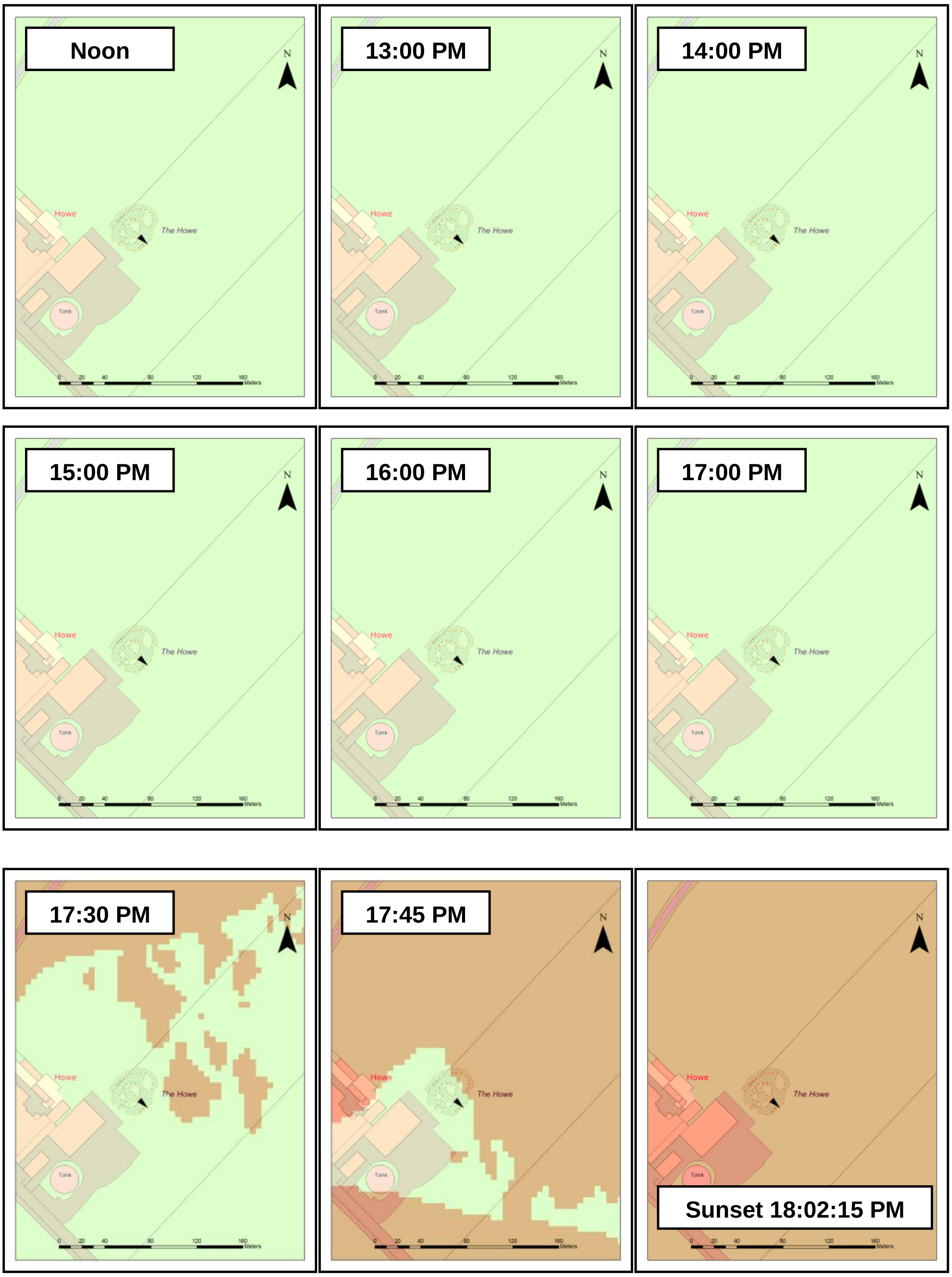


Figure 5.413. Sunrise (02:36:40 AM) to 08:00 AM around The Howe on the Summer Solstice (21st June). Red areas denote areas of shadow.

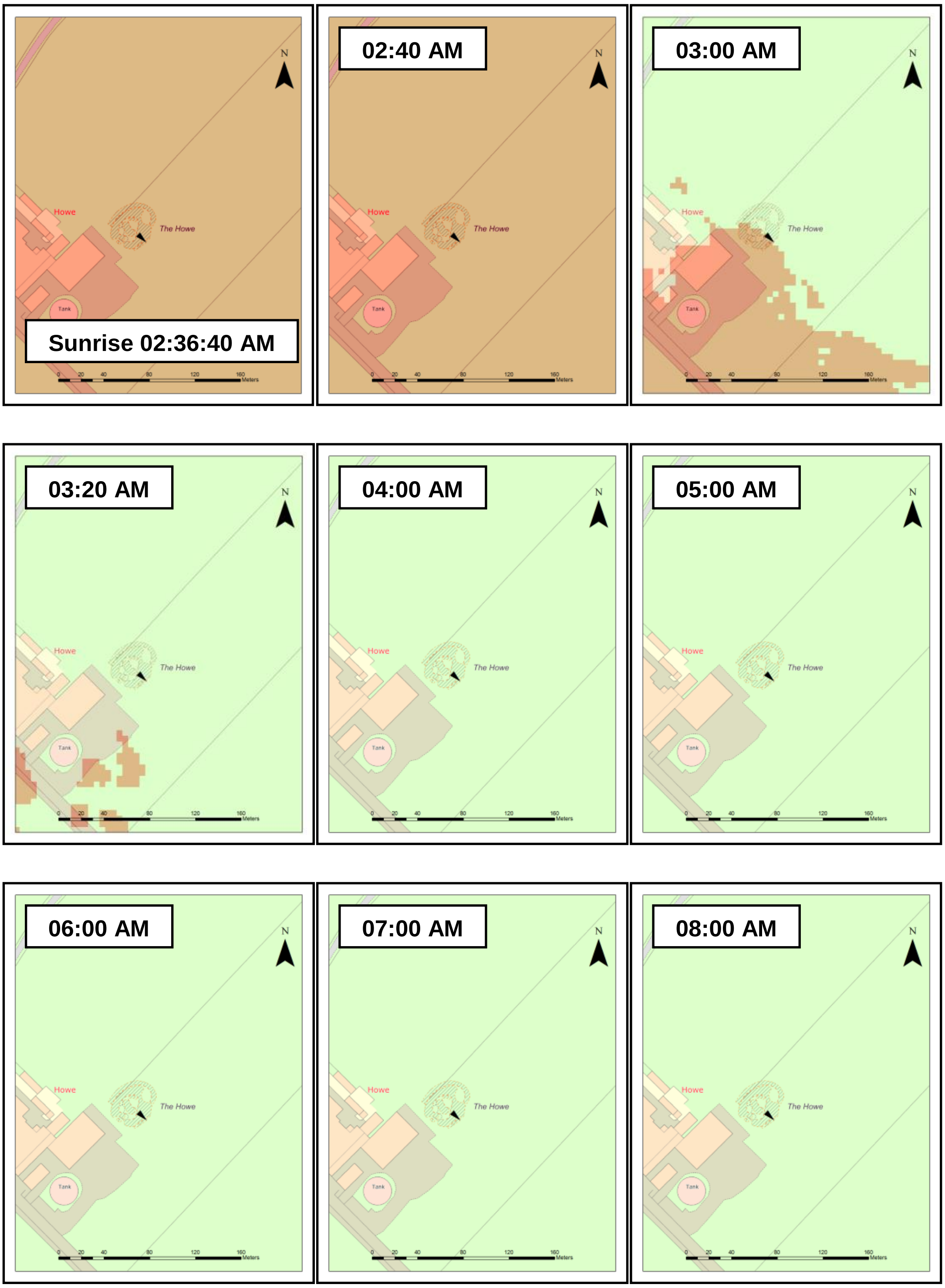


Figure 5.414. 09:00 PM to 17:00 PM around The Howe on the Summer Solstice (21st June). Red areas denote areas of shadow.

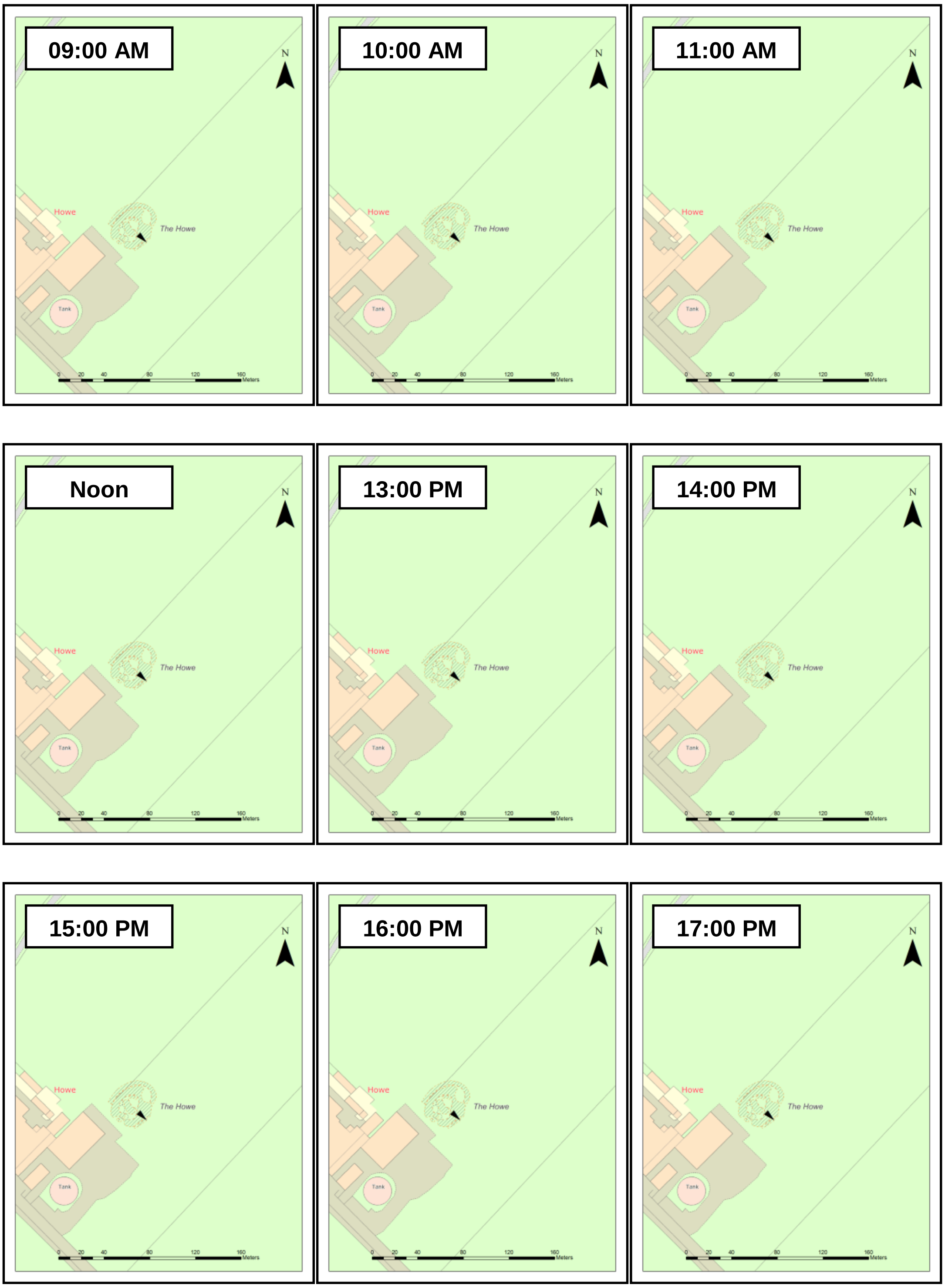
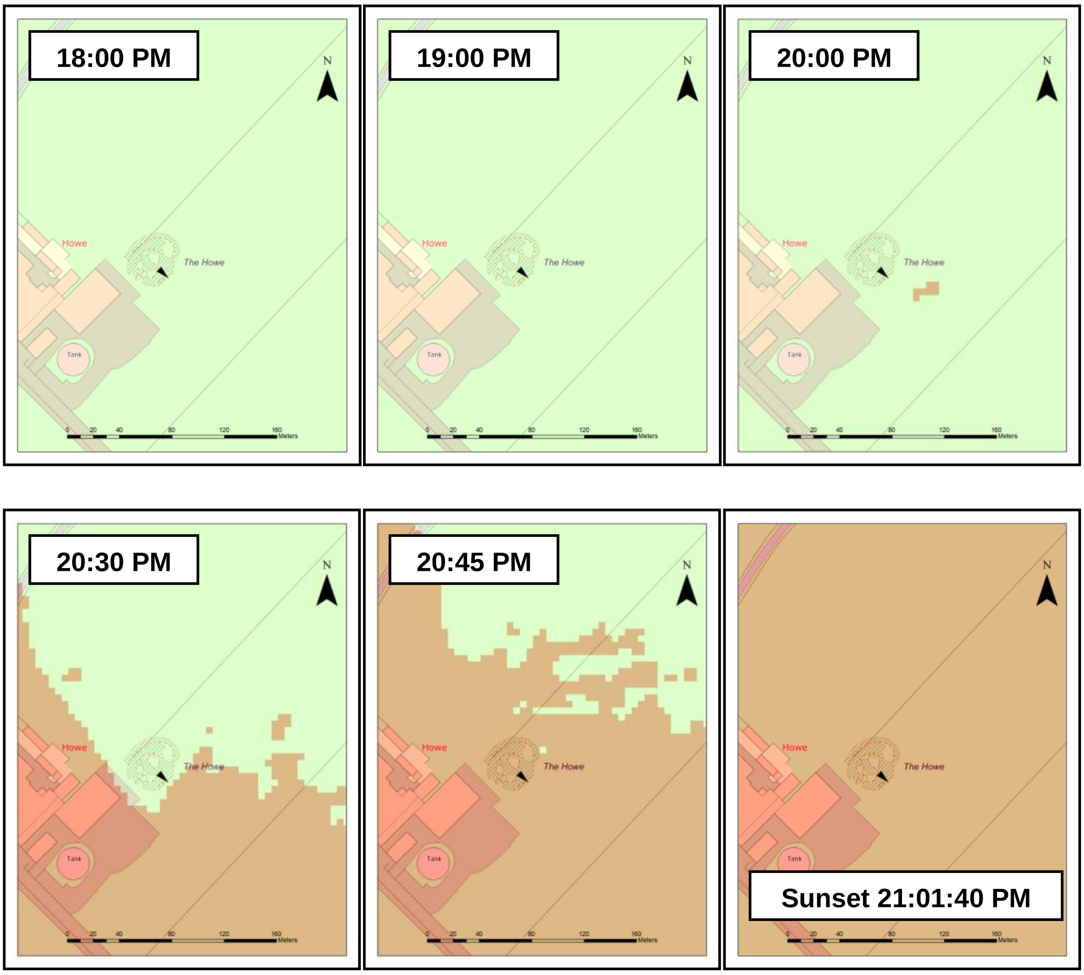


Figure 5.415. 18:00 PM to Sunset (21:01:40 PM) around The Howe on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 18: Dingy's Howe

Canmore ID: 3062

Entrance: SE

The Broch and its Landscape Context

This broch (Figures 5.416 and 5.417), excavated by Farrer in 1860 (Hedges 1987b: 78-79; for further work, see: Anderson 1878: 318; Petrie 1873: 88; RCAHMS 1987: 23), stands at the west end of the isthmus joining Deerness to the mainland. As such it has views of the coast to the north and south (Figure 5.418). It also has views as far away as the islands of Rousay and Eday, and to the north, it has a commanding view of Deer Sound and its large bay. To the south, it has views out to sea, so that any boat approaching Orkney from the south and south-east would have been visible when approaching Scapa Flow.

The Winter Solstice – Figures 5.419 and 5.420

During winter, the entrance was immediately lit at sunrise. The broch then retains light until approximately 14:00 PM, about forty-five minutes before sunset. The SE entrance was thus the best available.

The Equinox (21st March) – Figures 5.421 and 5.422

The broch receives direct sunlight within ten minutes after sunrise, retaining it until approximately 17:45 PM, about fifteen minutes before sunset. The eastern entrance would have thus been marginally more suitable during spring and autumn.

The Summer Solstice (21st June) – Figures 5.423, 5.424 and 5.425

The broch gains direct sunlight about twenty minutes after sunrise, retaining it until only about five minutes before sunset. For this time of year, an entrance towards the west would have gained more light.

Conclusions

Like other brochs in Orkney, such as Howe, Dingy's Howe and its entrance orientation is well suited to the winter months, though this entrance would have lost light during the summer. This may suggest a focus on winter, and may even indicate a seasonal usage for many brochs in Orkney.

Figure 5.416. Remains of Dingy’s Howe.
Author’s Photo.

Figure 5.417. View towards the SE from Dingy’s Howe.
Author’s Photo.

Figure 5.418. Multiple Viewsheds of Dingy's Howe

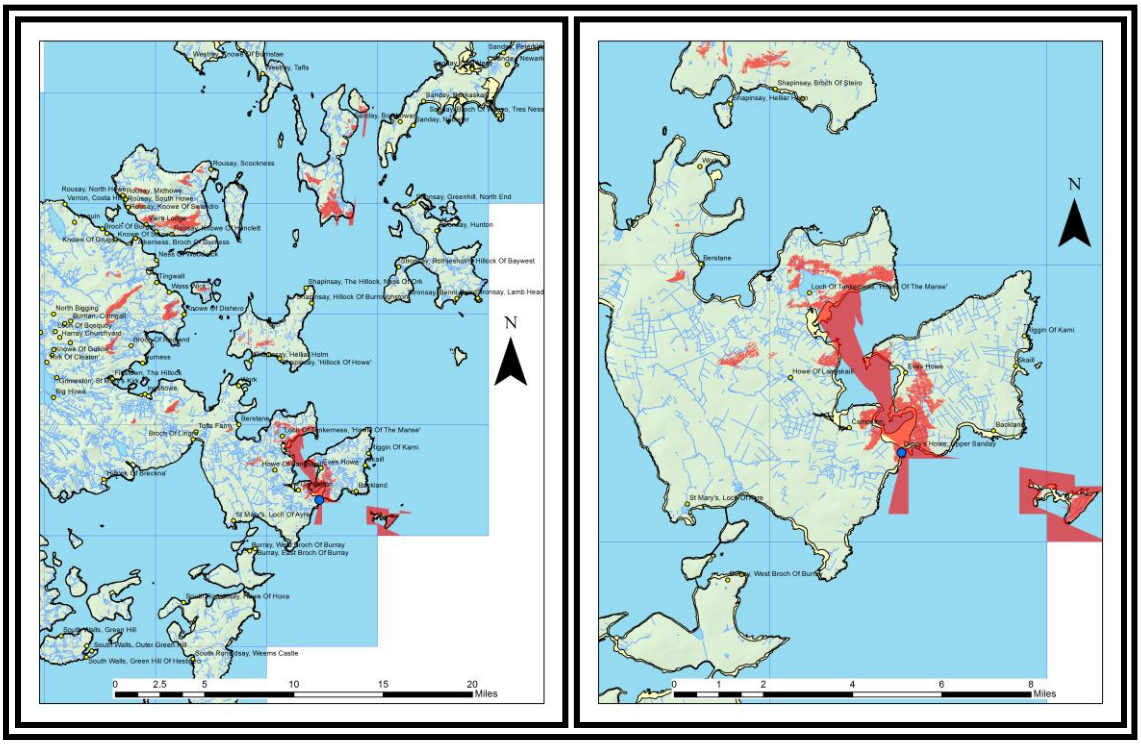


Figure 5.419. Sunrise (08:44 AM) to 13:00 PM around Dingy's Howe on the Winter Solstice (21st December). Red areas denote areas of shadow.

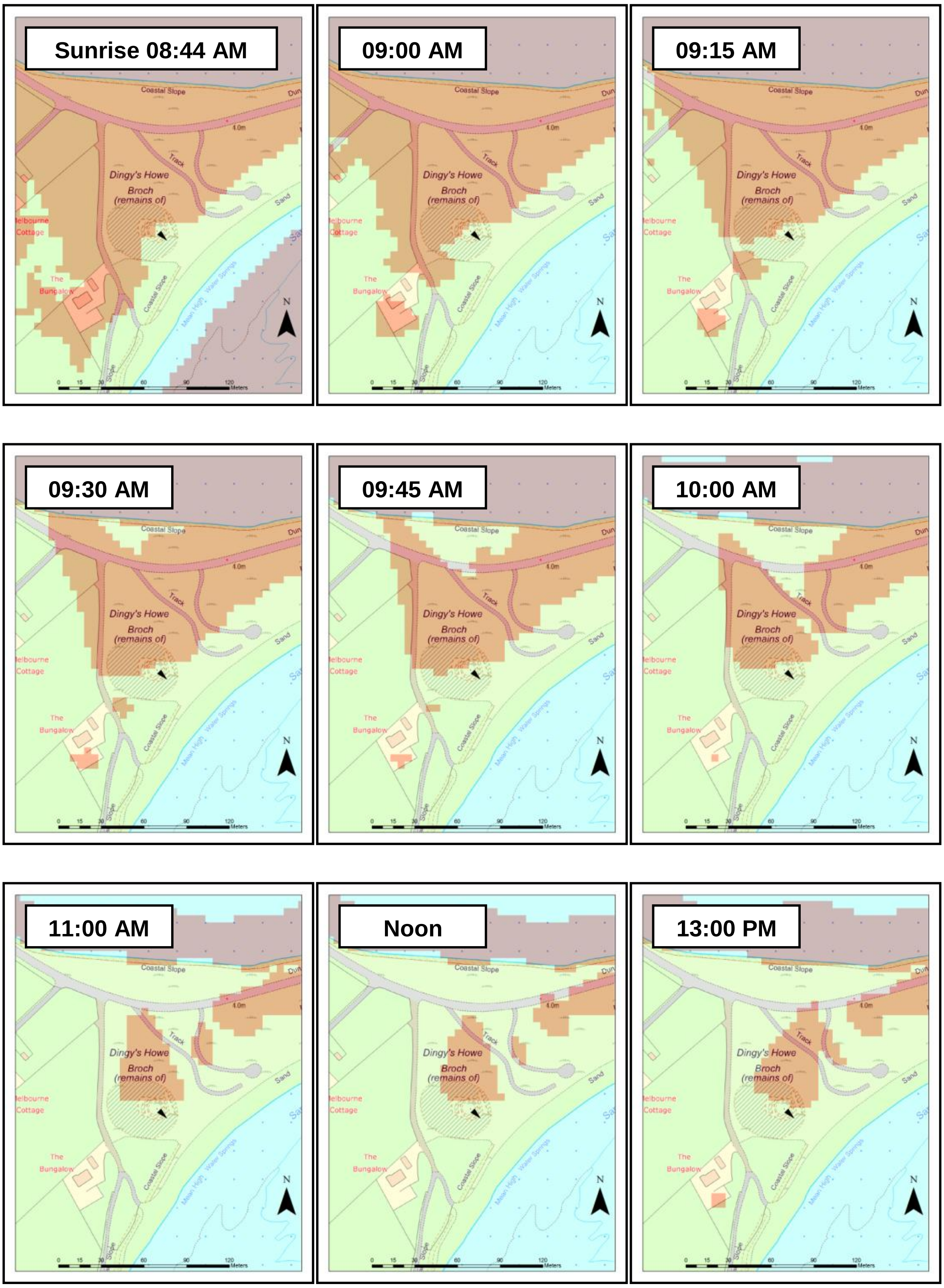


Figure 5.420. 13:30 PM to Sunset (14:47 PM) around Dingy's Howe on the Winter Solstice (21st December). Red areas denote areas of shadow.

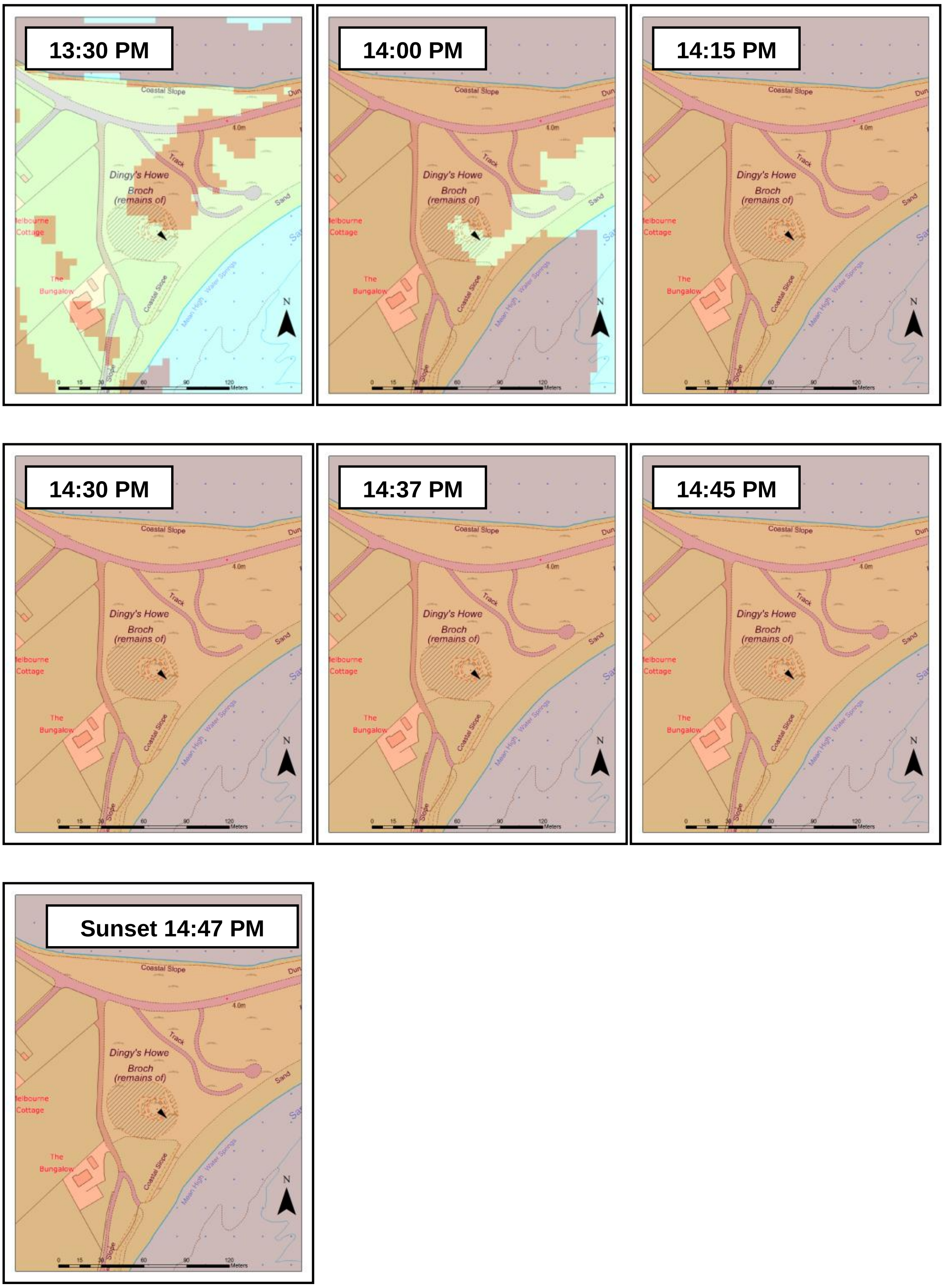


Figure 5.421. Sunrise (05:48 AM) to 11:00 AM around Dingy's Howe on the Spring Equinox (21st March). Red areas denote areas of shadow.

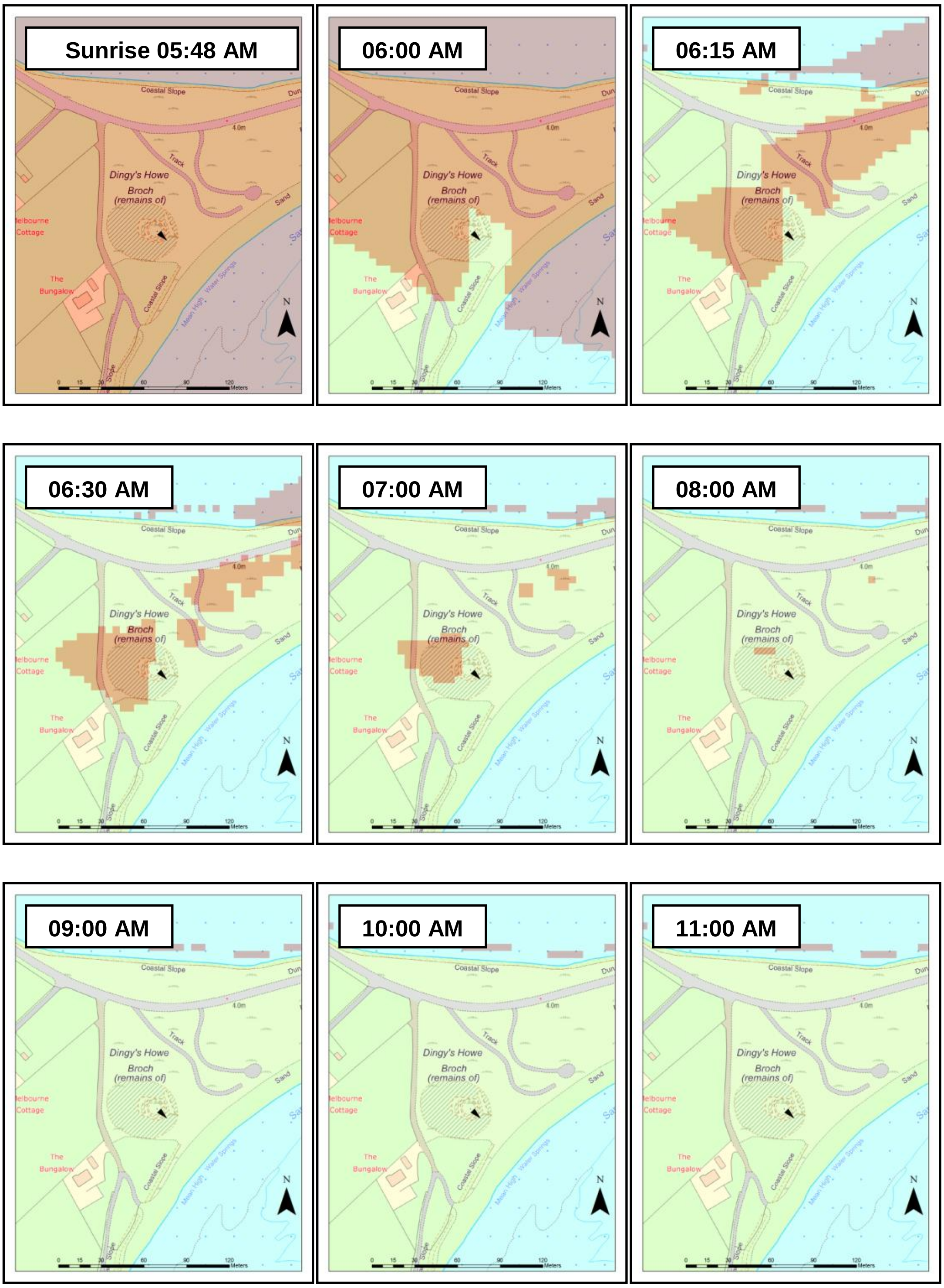


Figure 5.422. Noon to Sunset (18:02:15 PM) around Dingy's Howe on the Spring Equinox (21st March). Red areas denote areas of shadow.

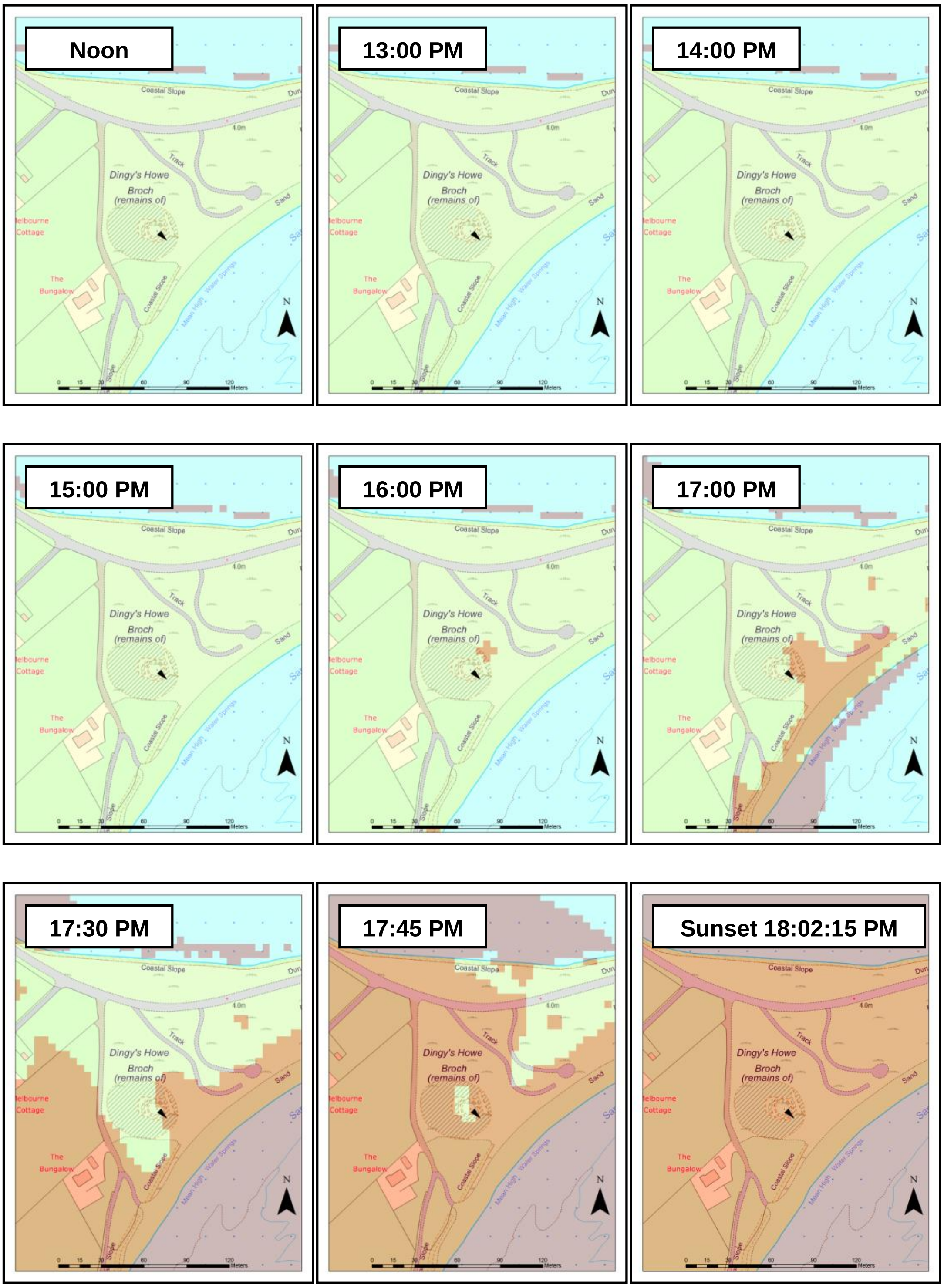


Figure 5.423. Sunrise (02:36:40 AM) to 09:00 AM around Dingy's Howe on the Summer Solstice (21st June). Red areas denote areas of shadow.

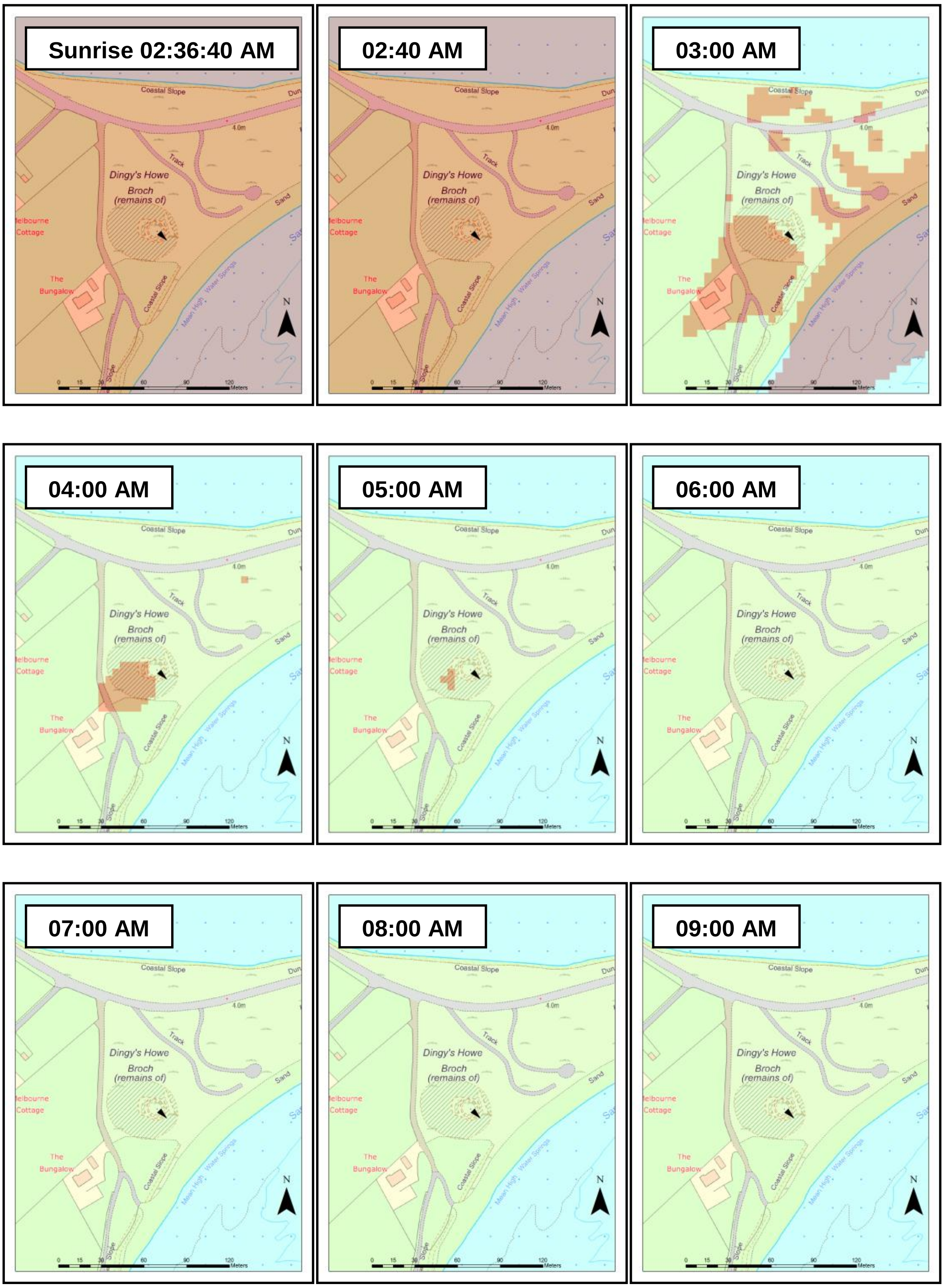
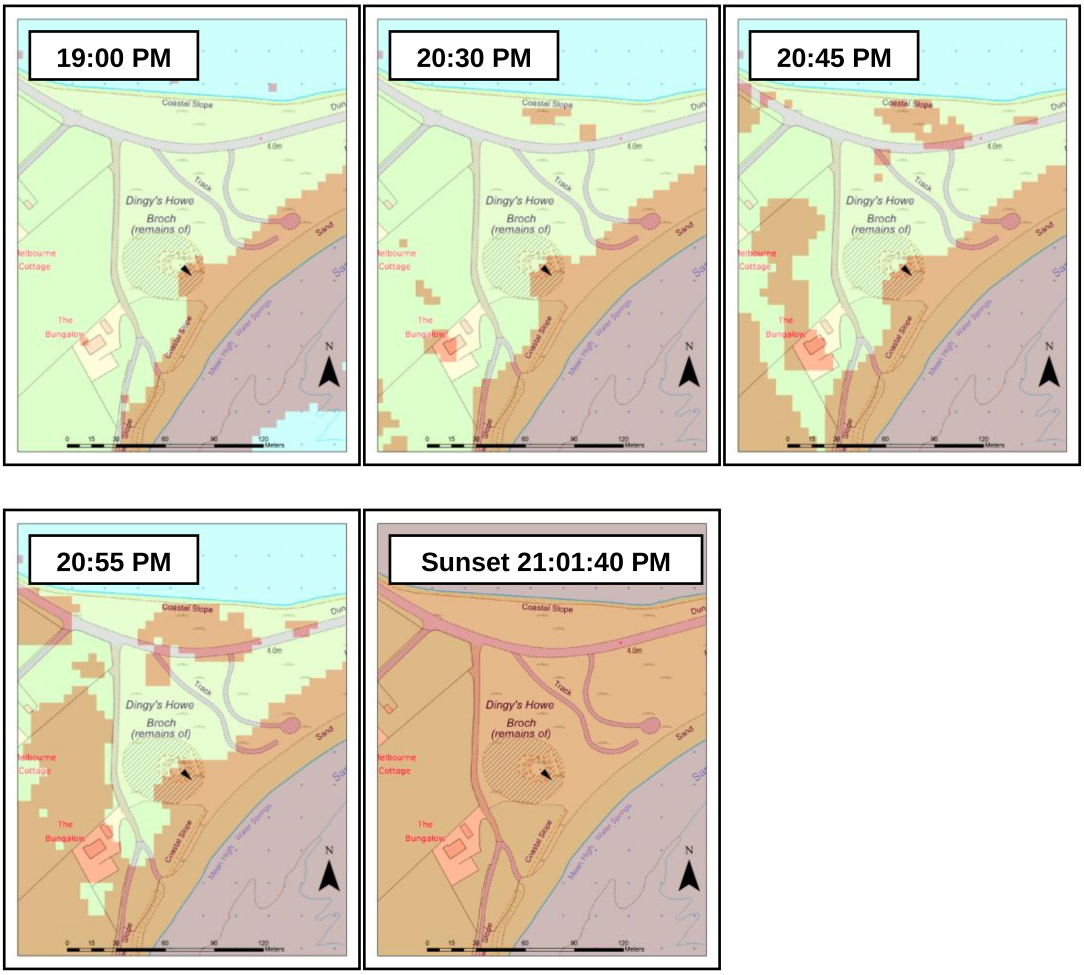


Figure 5.424. 10:00 AM to 18:00 PM around Dingy's Howe on the Summer Solstice (21st June). Red areas denote areas of shadow.

Figure 5.425. 19:00 PM to Sunset (21:01:40 PM) around Dingy's Howe on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 19: Riggin Of Kami

Canmore ID: 2934

Entrance: SSW

The Broch and its Landscape Context

Partially excavated in 1981-82 (MacKie 2002a: 248-249; see also: Smith 1988), this broch (Figures 5.426 and 5.427), on the landward end of a triangular cliff promontory, has a very limited view of the Mainland of Orkney upon which it is sited (Figure 5.428). It does, however, possess good views of the sea, southwards towards the eastern entrance into Scapa Flow, and northwards towards Stronsay, so that any boat travelling up the eastern side of Mainland would have been visible from this site.

The Winter Solstice – Figures 5.429 and 5.430

The broch gains light at sunrise, and it and its landscape then retain it for the day, until just after 14:30 PM, about fifteen minutes before sunset. The SSW entrance would have gained moderate amounts of light, as the sun is lower in the winter sky. An entrance towards the SE would have been more suitable however.

The Equinox (21st March) – Figures 5.431 and 5.432

Again, the broch gains light at sunrise, retaining it for the day, until sometime between 17:30 PM and 17:45 PM, probably about twenty five minutes before sunset. The SSW entrance would have gained marginal amounts of light during this period due to the height of the sun during this time of year. An entrance to the east would have been best.

The Summer Solstice (21st June) Figures 5.433, 5.434 and 5.435

The broch again gains light at sunrise, retaining it until just after 20:30 PM, about half and hour before sunset. As the sun is at its highest during summer, its southern doorway would have gained little direct light as the sun is highest in the southern sky.

Conclusions

Throughout the year, an eastern entrance would have gained more light. Like many brochs in Orkney, its doorway was at its most beneficial during the winter months, and this is true here, even though a doorway to the SE would have been more suitable.

Figure 5.426. Looking South towards Riggin of Kami Broch. Author's Photo.

Figure 5.427. Ground Plan of Riggin of Kami.
(After: MacKie 2002a: 340: fig. 5.121).

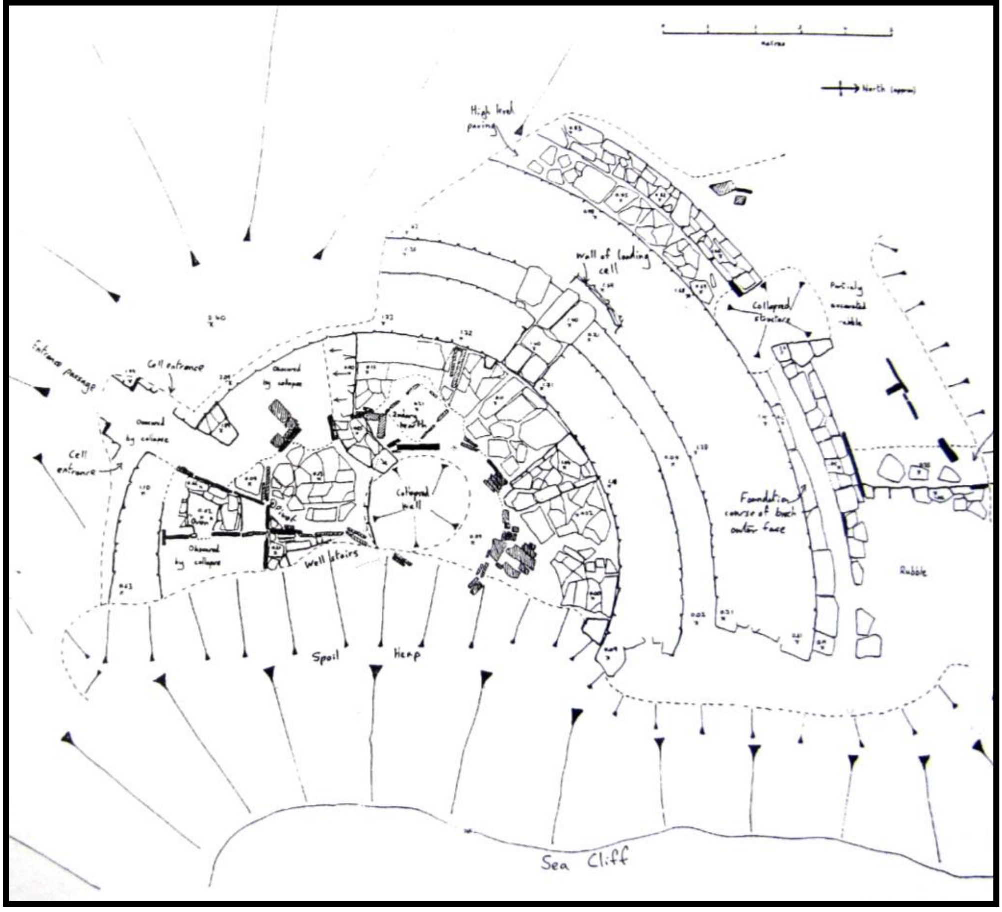


Figure 5.428. Multiple Viewsheds of Riggin of Kami.

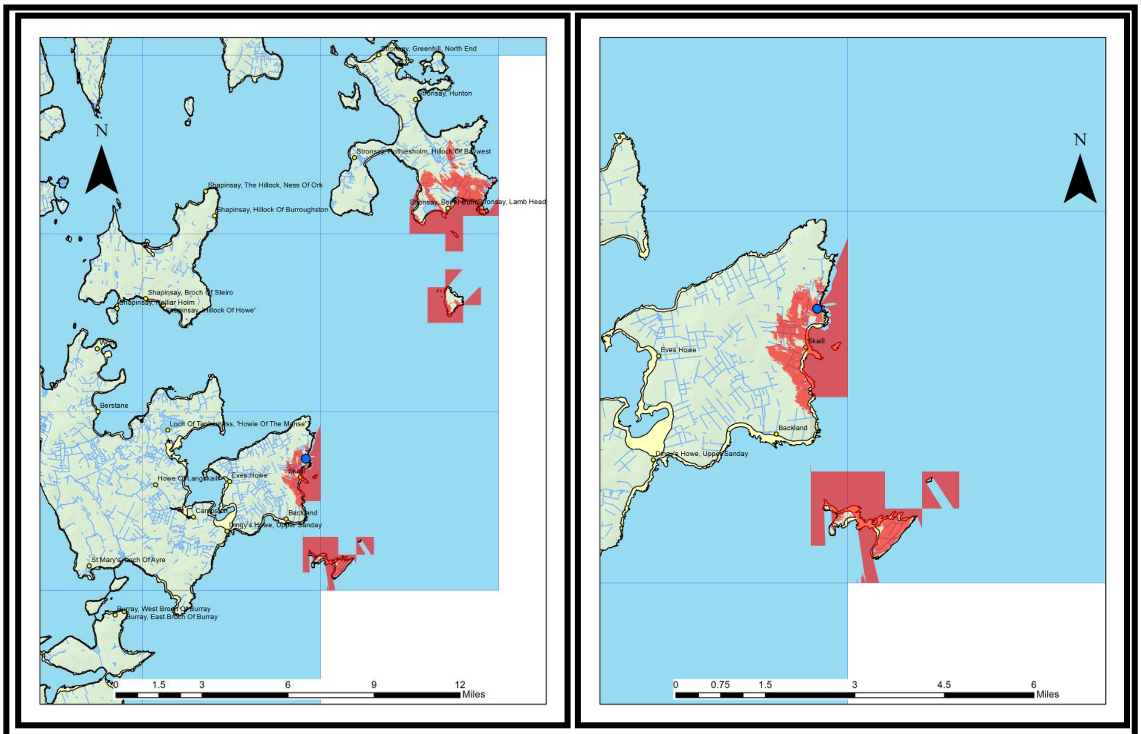


Figure 5.429. Sunrise (08:44 AM) to 13:00 PM around Riggin of Kami on the Winter Solstice (21st December). Red areas denote areas of shadow.

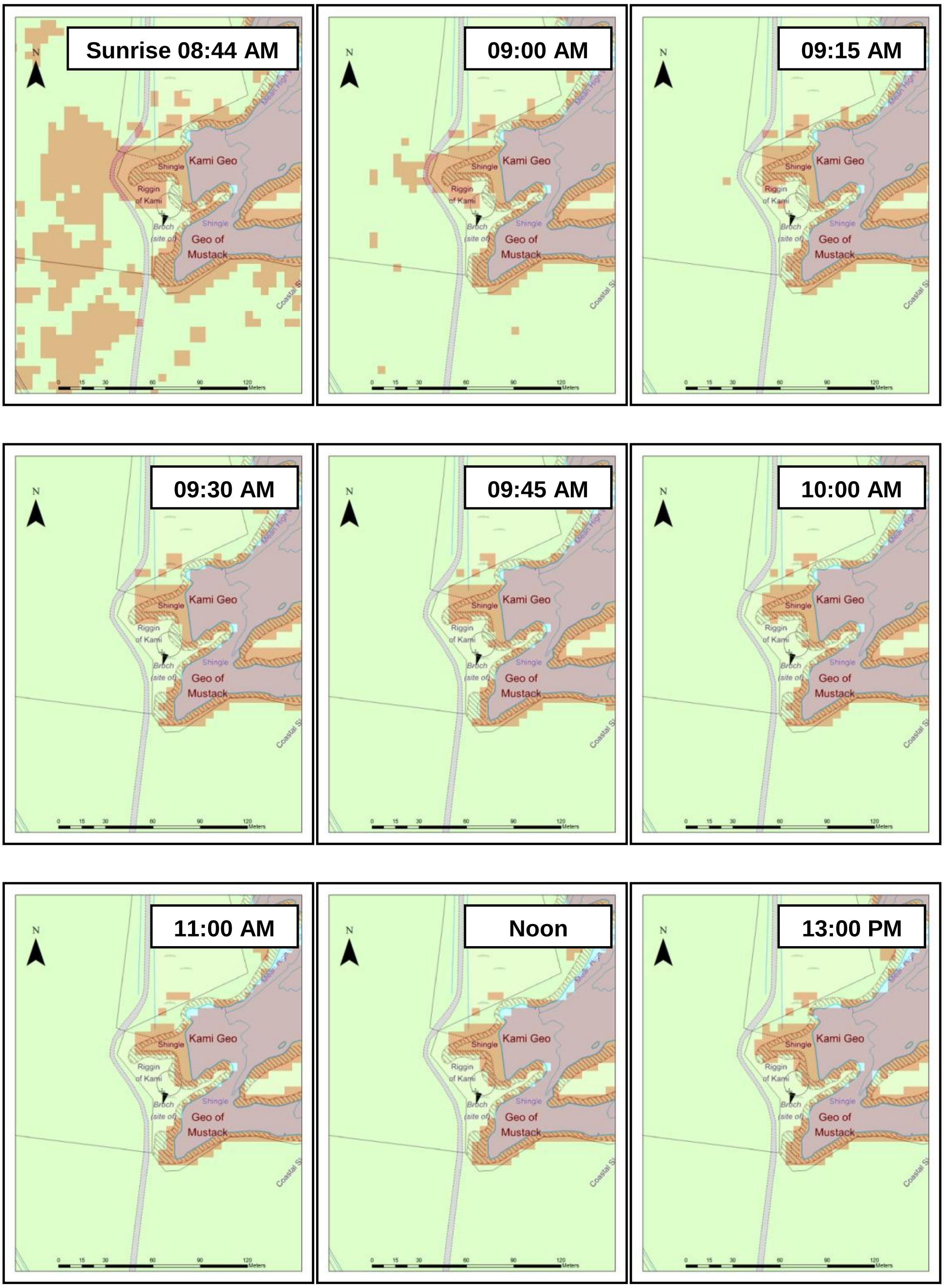


Figure 5.430. 13:30 PM to Sunset (14:47 PM) around Riggin of Kami on the Winter Solstice (21st December). Red areas denote areas of shadow.

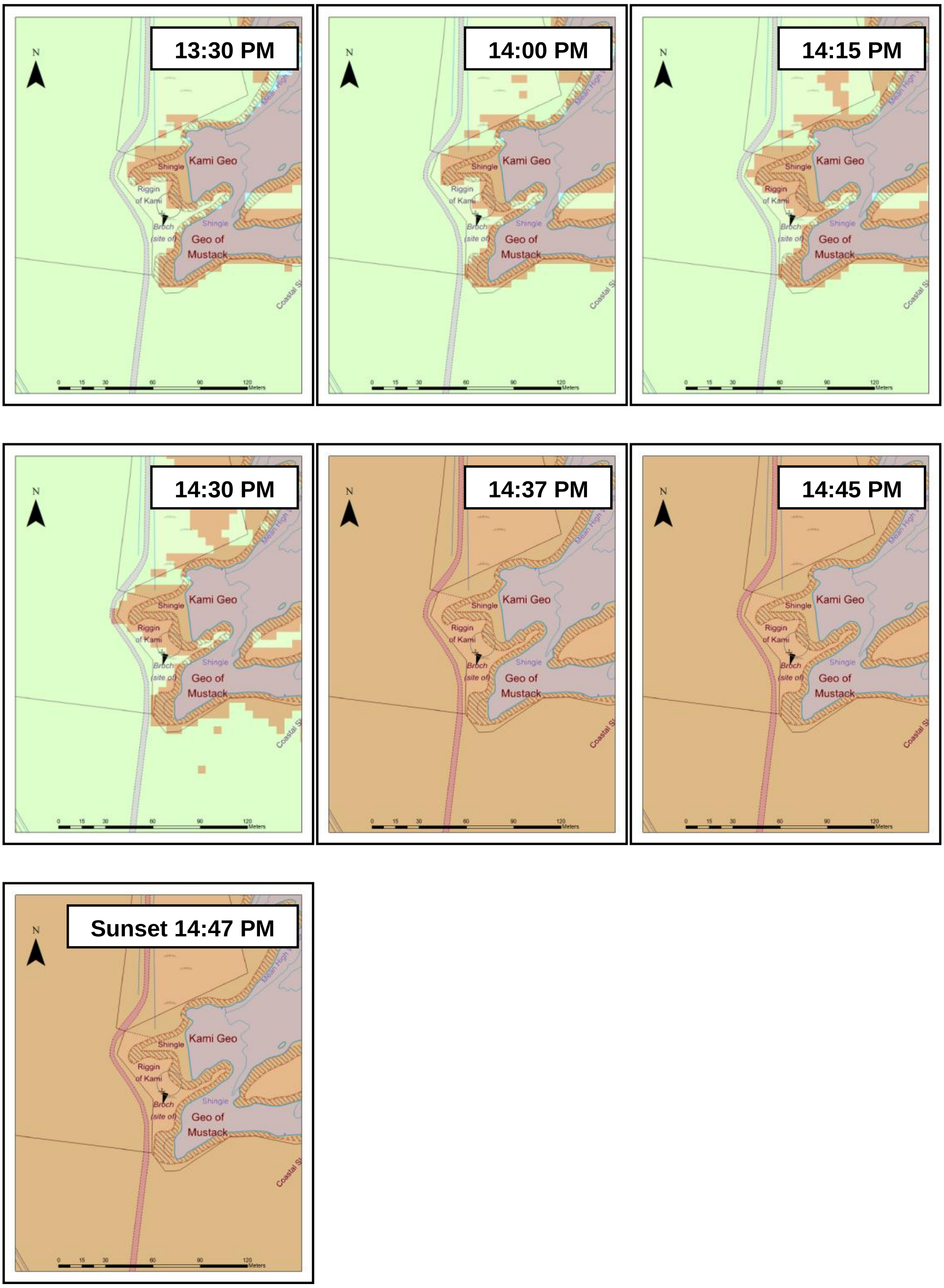


Figure 5.431. Sunrise (05:48 AM) to 11:00 AM around Riggin of Kami on the Spring Equinox (21st March). Red areas denote areas of shadow.

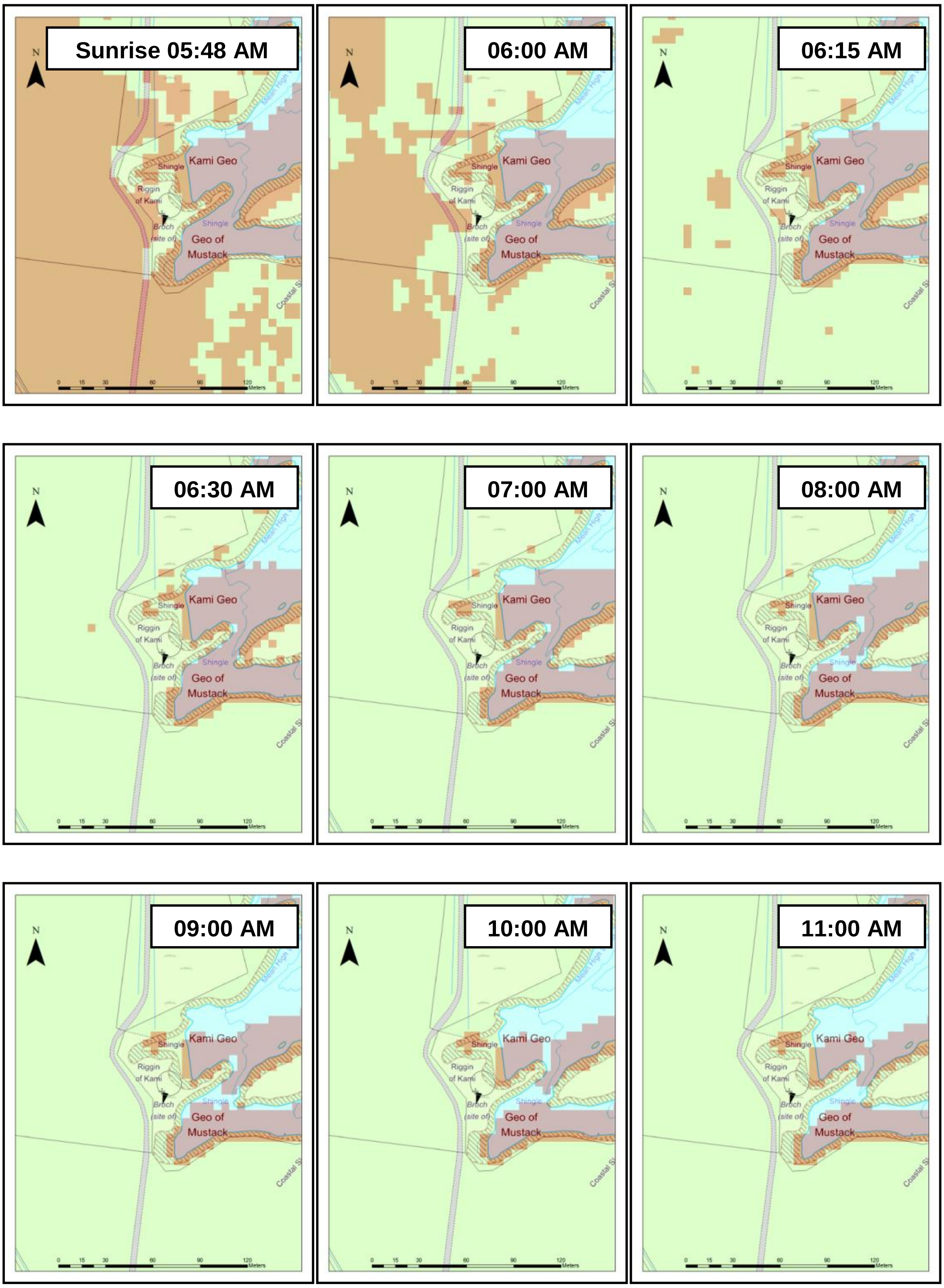
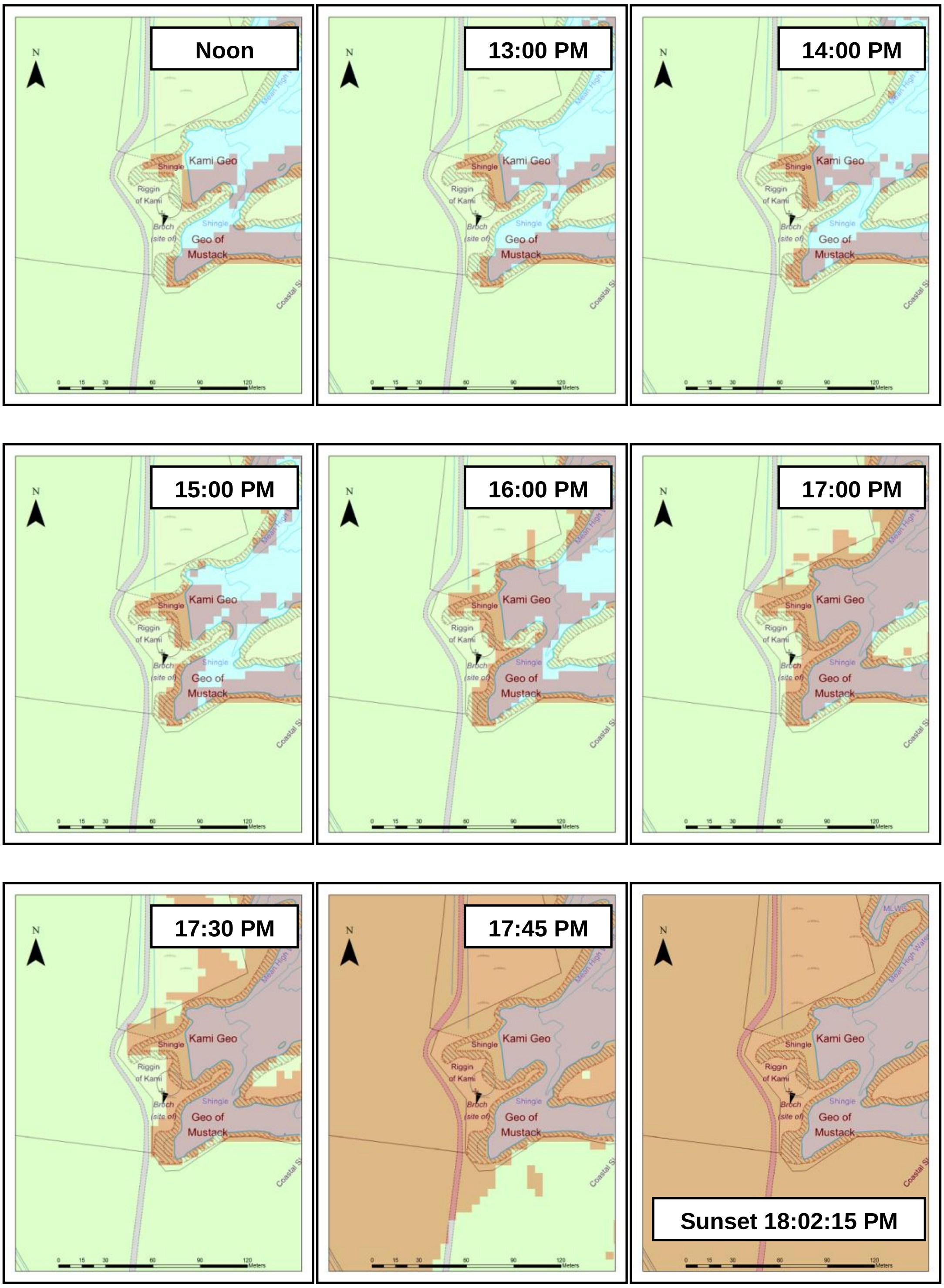


Figure 5.432. Noon to Sunset (18:02:15 PM) around Riggin of Kami on the Spring Equinox (21st March). Red areas denote areas of shadow.



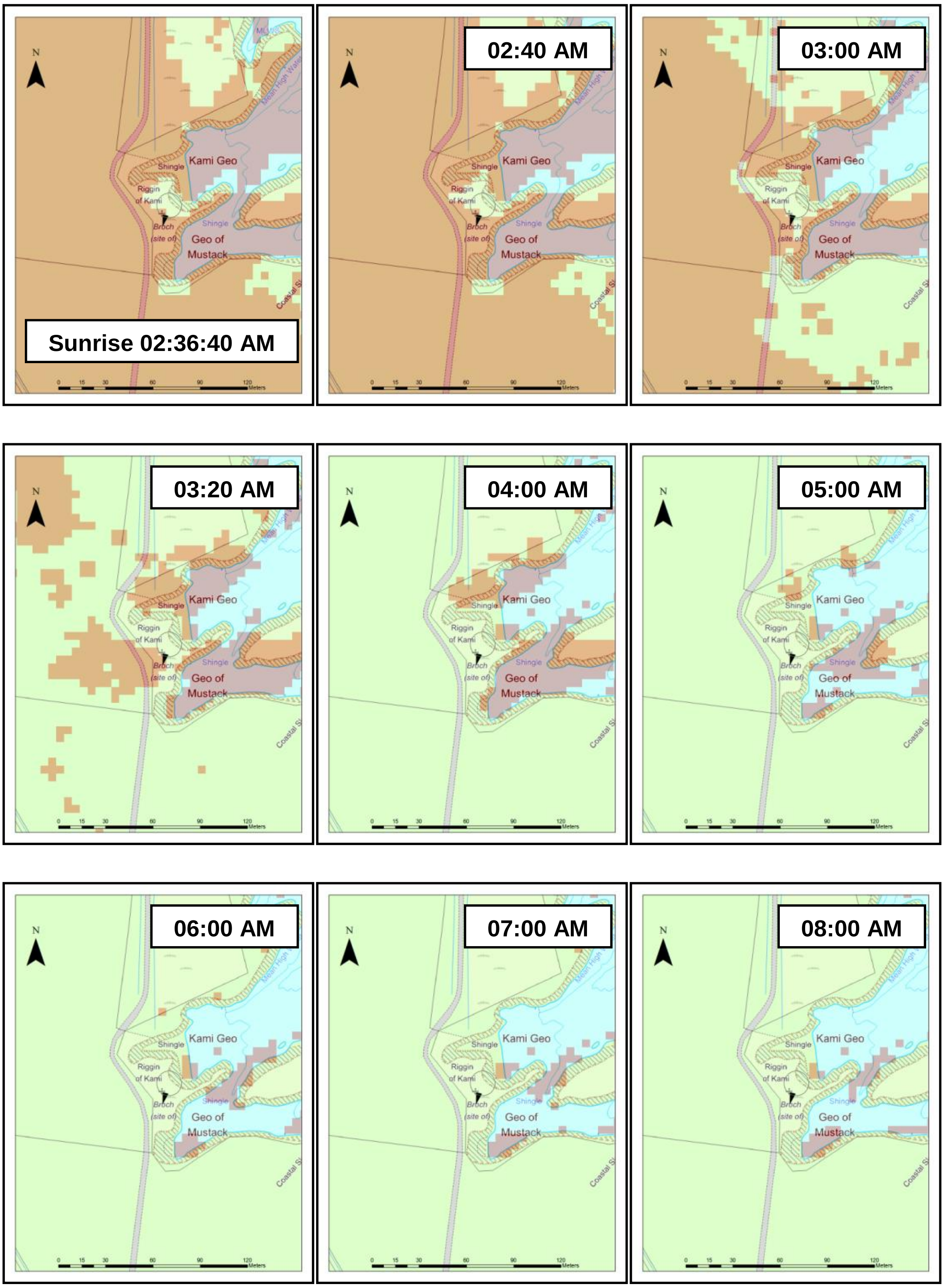


Figure 5.433. Sunrise (02:36:40 AM) to 08:00 AM around Riggin of Kami on the Summer Solstice (21st June). Red areas denote areas of shadow.

Figure 5.434. 09:00 AM to 17:00 PM around Riggin of Kami on the Summer Solstice (21st June). Red areas denote areas of shadow.

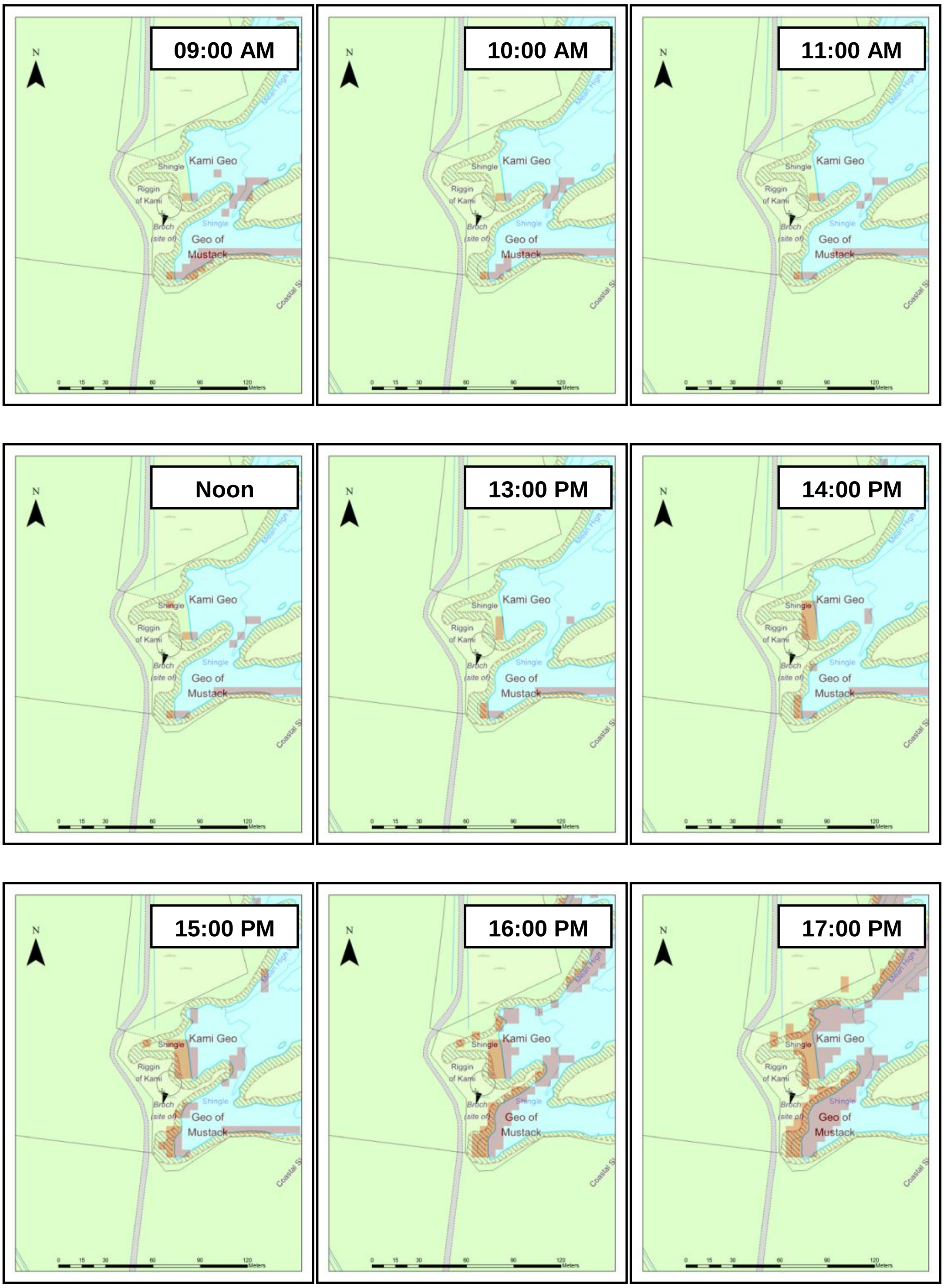
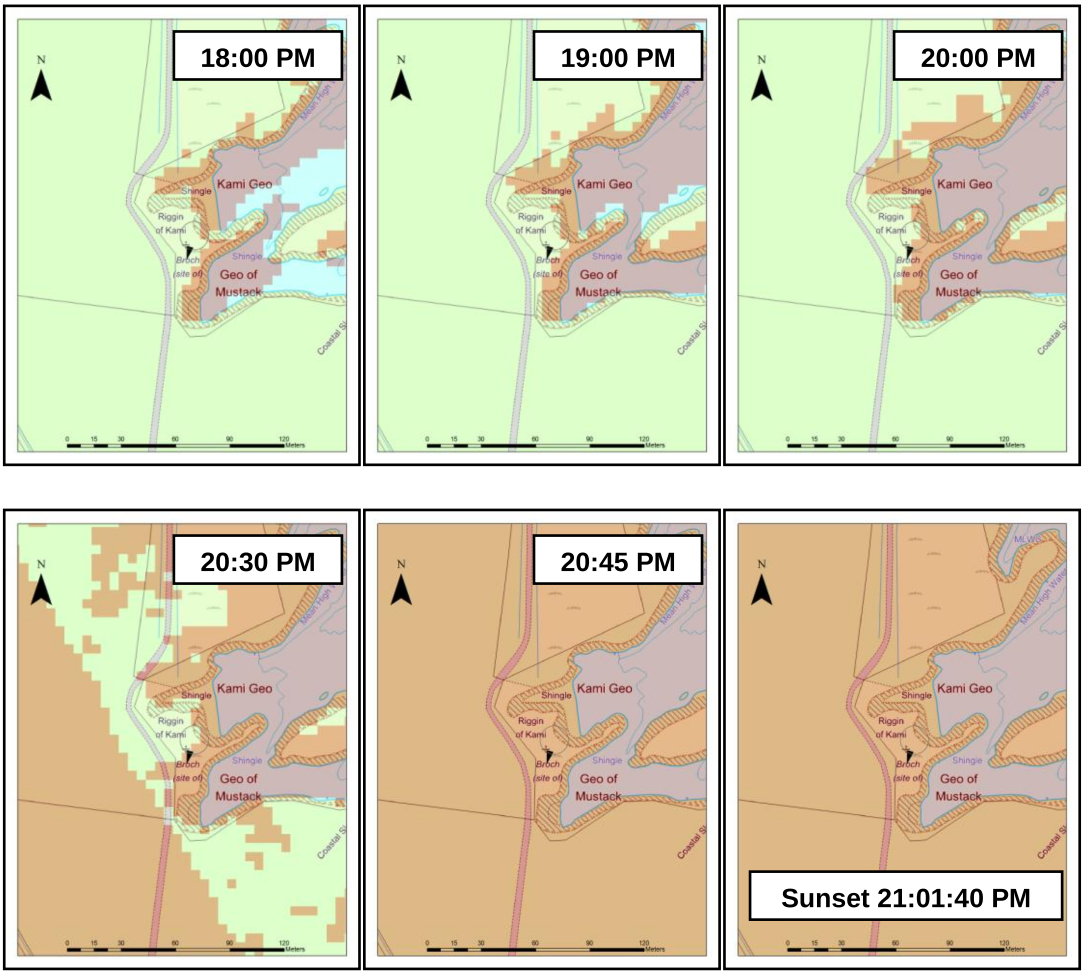


Figure 5.435. 18:00 PM to Sunset (21:01:40 PM) around Riggin of Kami on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 20: Ingshowe

Canmore ID: 2089

Entrance: SW

The Broch and its Landscape Context

Excavated by Farrer in around 1866 (Petrie 1927: 23; see also: Fraser 1927: 52; RCAHMS 1946: 92), Ingshowe broch, close to the shore at the point of a low peninsula, has a potentially strategic and commanding view out to sea over the Bay of Firth (Figure 5.436), as well as much of the land around it. To the north, it also possesses a good view towards Eday and Shapinsay. Boats travelling northwards through either the Bay of Firth, or even towards Eynhallow Sound where many other brochs are located, would have been visible from Ingshowe.

The Winter Solstice – Figures 5.437 and 5.438

The site gains direct sunlight within the first half hour after sunrise, and retains it until sometime between 13:30 PM and 14:00 PM, probably at least an hour before sunset. The SW entrance would have thus lost noticeably more light than a SE doorway would have in the winter.

The Equinox (21st March) – Figures 5.439 and 5.440

The broch gains direct sunlight within ten minutes after sunrise, retaining it until just after 17:45 PM, about fifteen minutes before sunset. Again, an eastern entrance would have gained slightly more light.

The Summer Solstice (21st June) – Figures 5.441, 5.442 and 5.443

The site gains direct sunlight within four minutes after sunrise, and then retains it for the day, until sometime between 20:30 PM and 20:45 PM, probably about ten minutes before sunset.

Conclusions

Interestingly, unlike many other Orcadian brochs, its entrance is not suitable for winter months. The SW entrance loses nearly an hour’s more light that a SE entrance would have gained. Further, throughout the remainder of the year, a

SE entrance would have been more suitable, gaining more light throughout the day than its SW doorway.

Figure 5.436. Multiple Viewsheds of Ingshowe

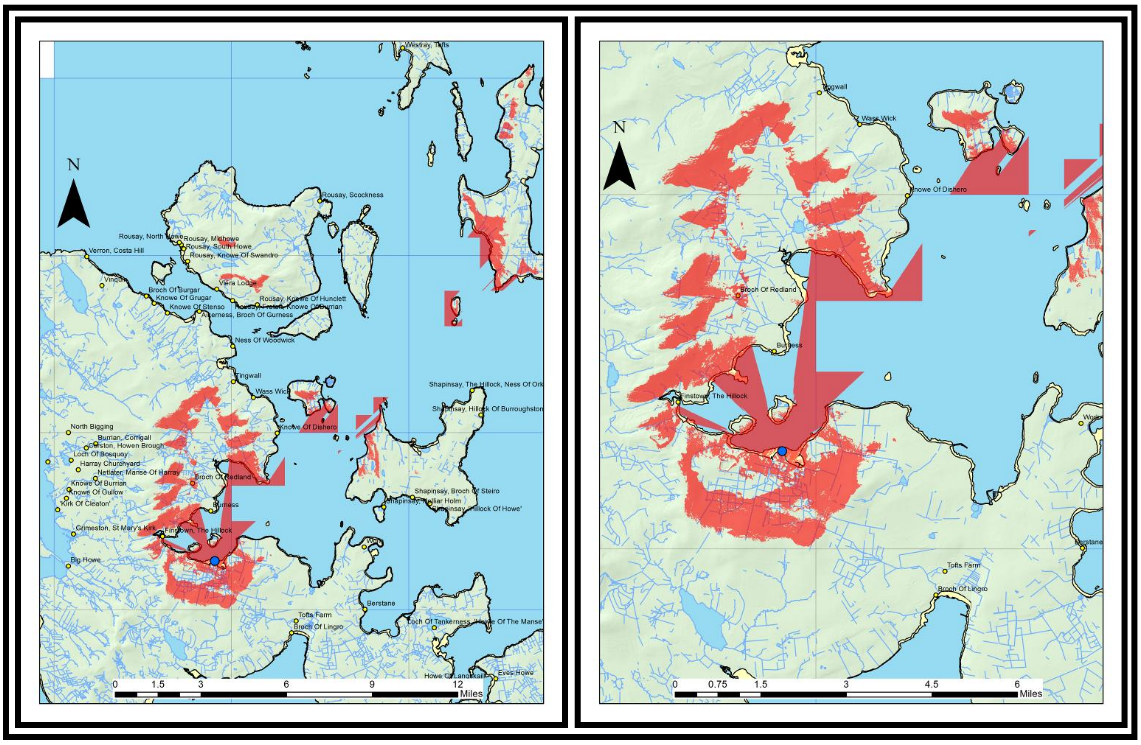


Figure 5.437. Sunrise (08:44 AM) to 13:00 PM around Ingshowe on the Winter Solstice (21st December). Red areas denote areas of shadow.

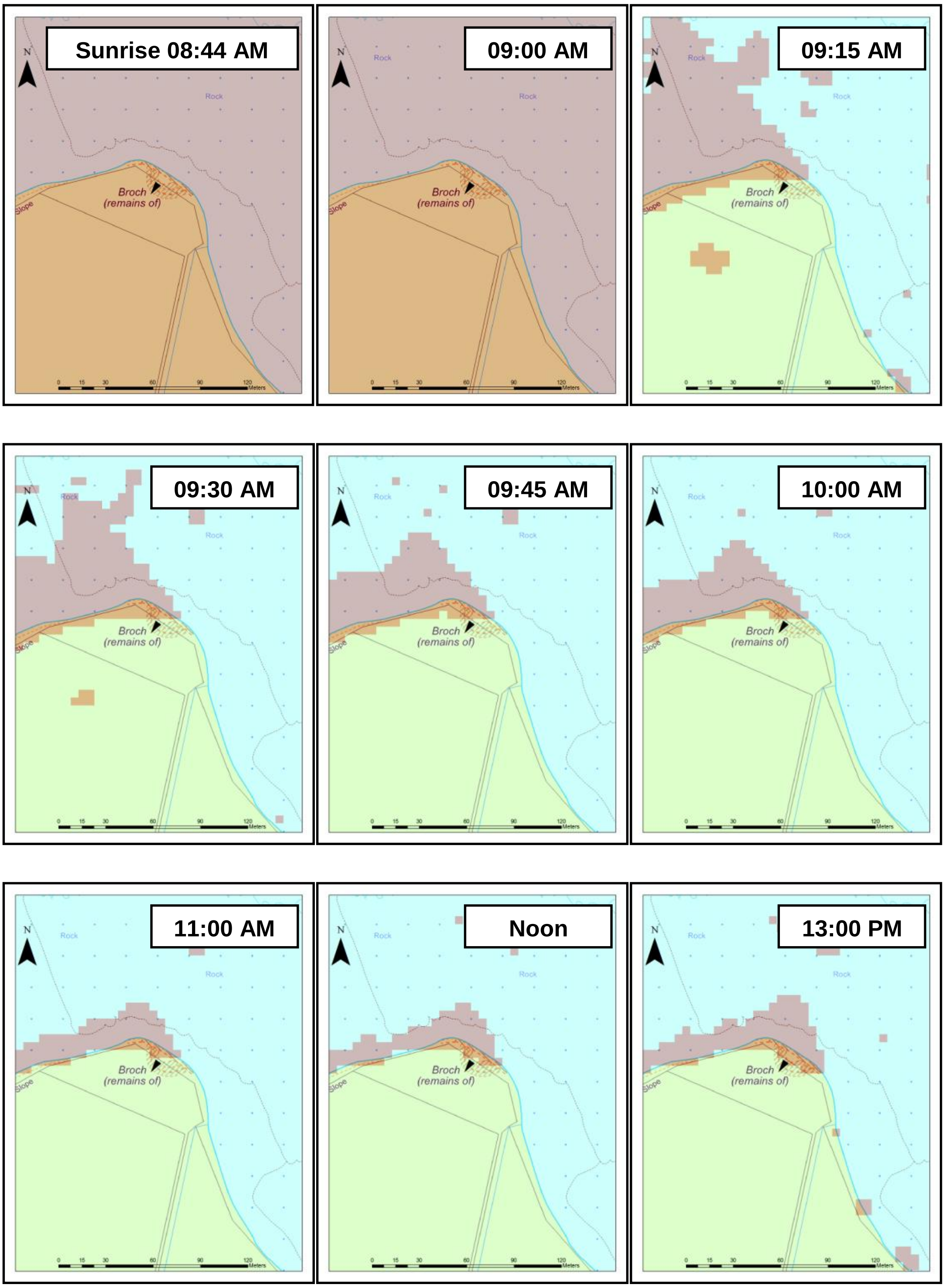


Figure 5.438. 13:30 PM to Sunset 14:47 PM around Ingshowe on the Winter Solstice (21st December). Red areas denote areas of shadow.

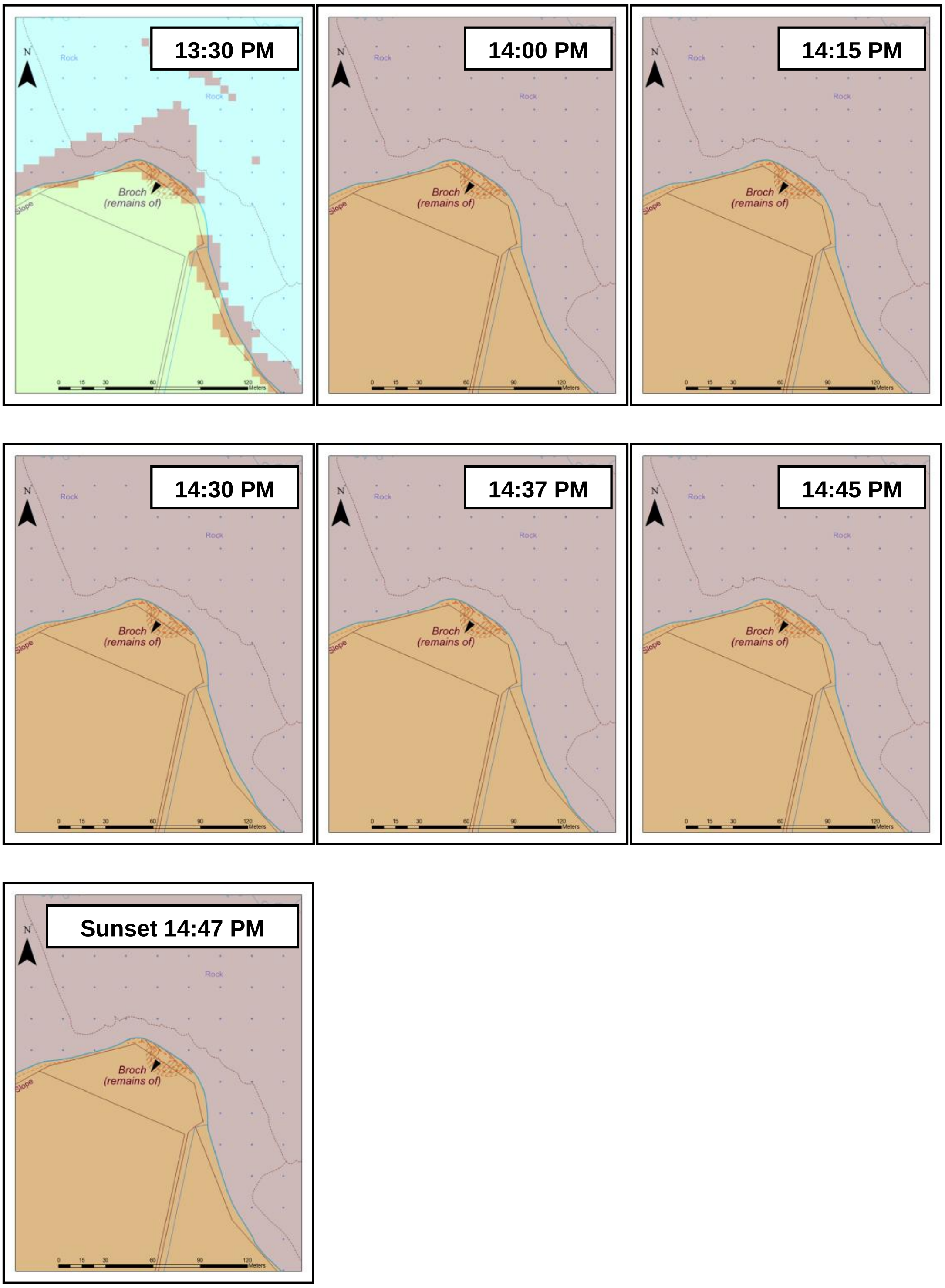


Figure 5.439. Sunrise (05:48 AM) to 11:00 AM around Ingshowe on the Spring Equinox (21st March). Red areas denote areas of shadow.

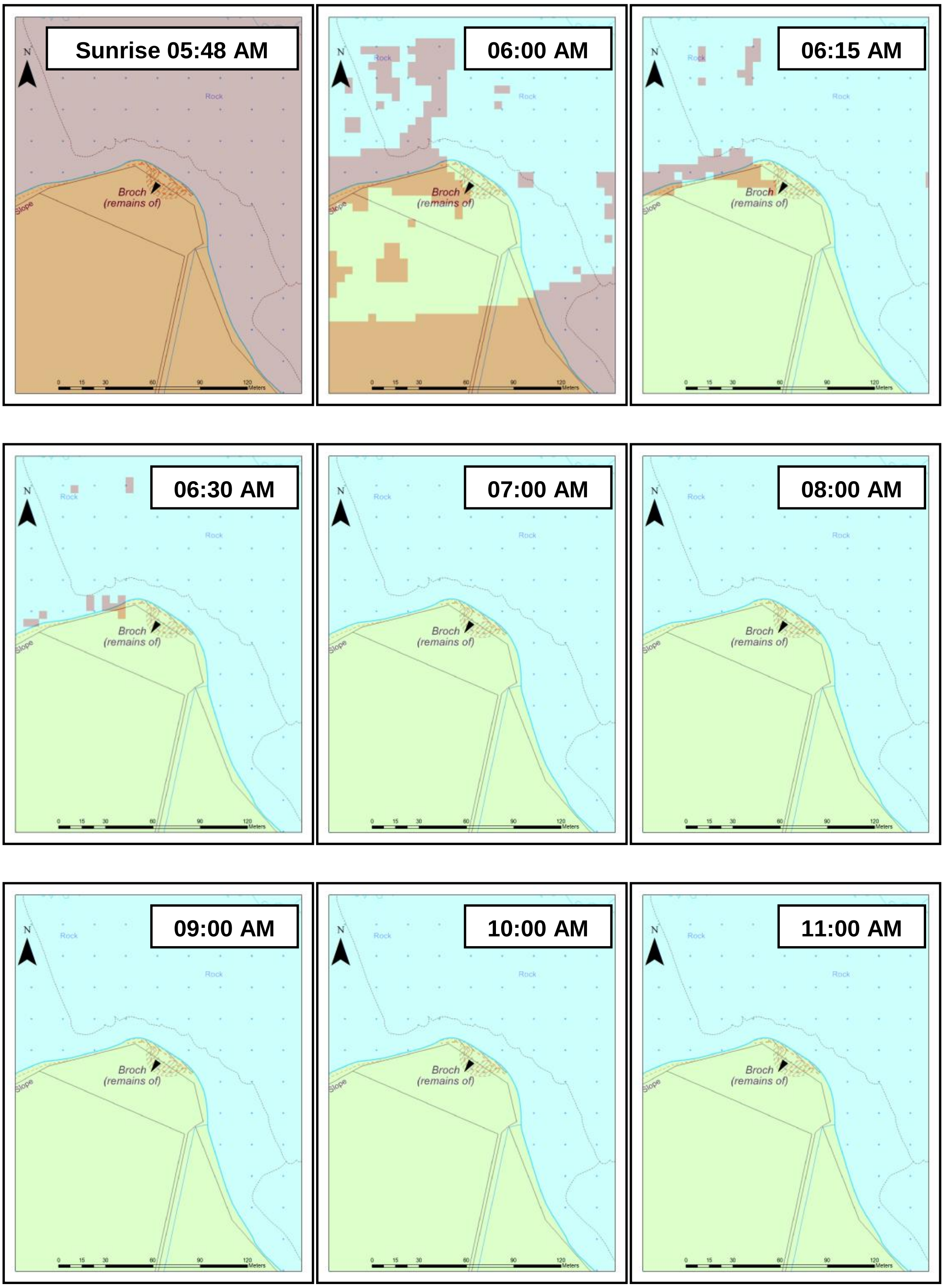


Figure 5.440. Noon to Sunset (18:02:15 PM) around Ingshowe on the Spring Equinox (21st March). Red areas denote areas of shadow.

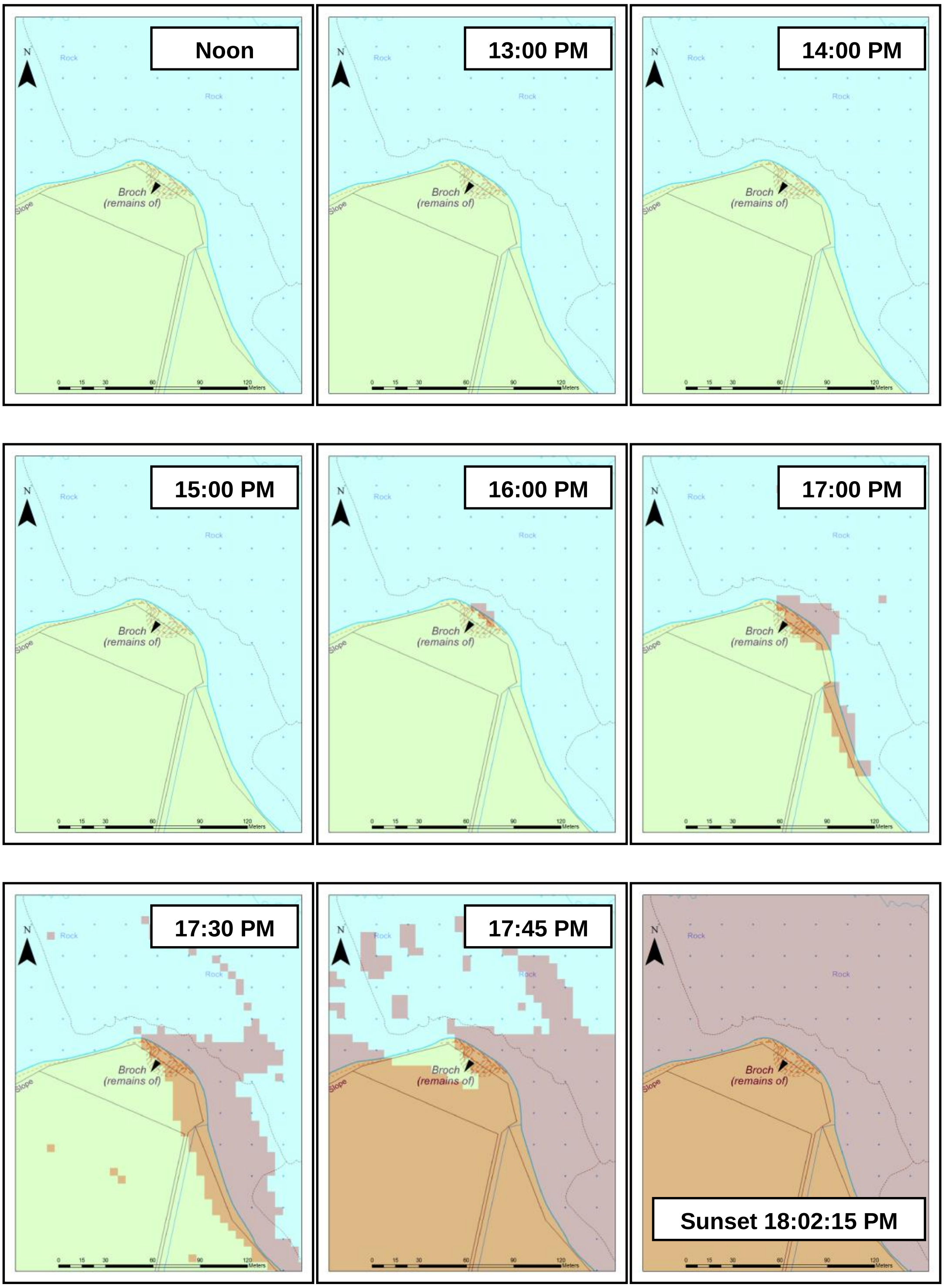


Figure 5.441. Sunrise (02:36:40 AM) to 08:00 AM around Ingshowe on the Summer Solstice (21st June). Red areas denote areas of shadow.

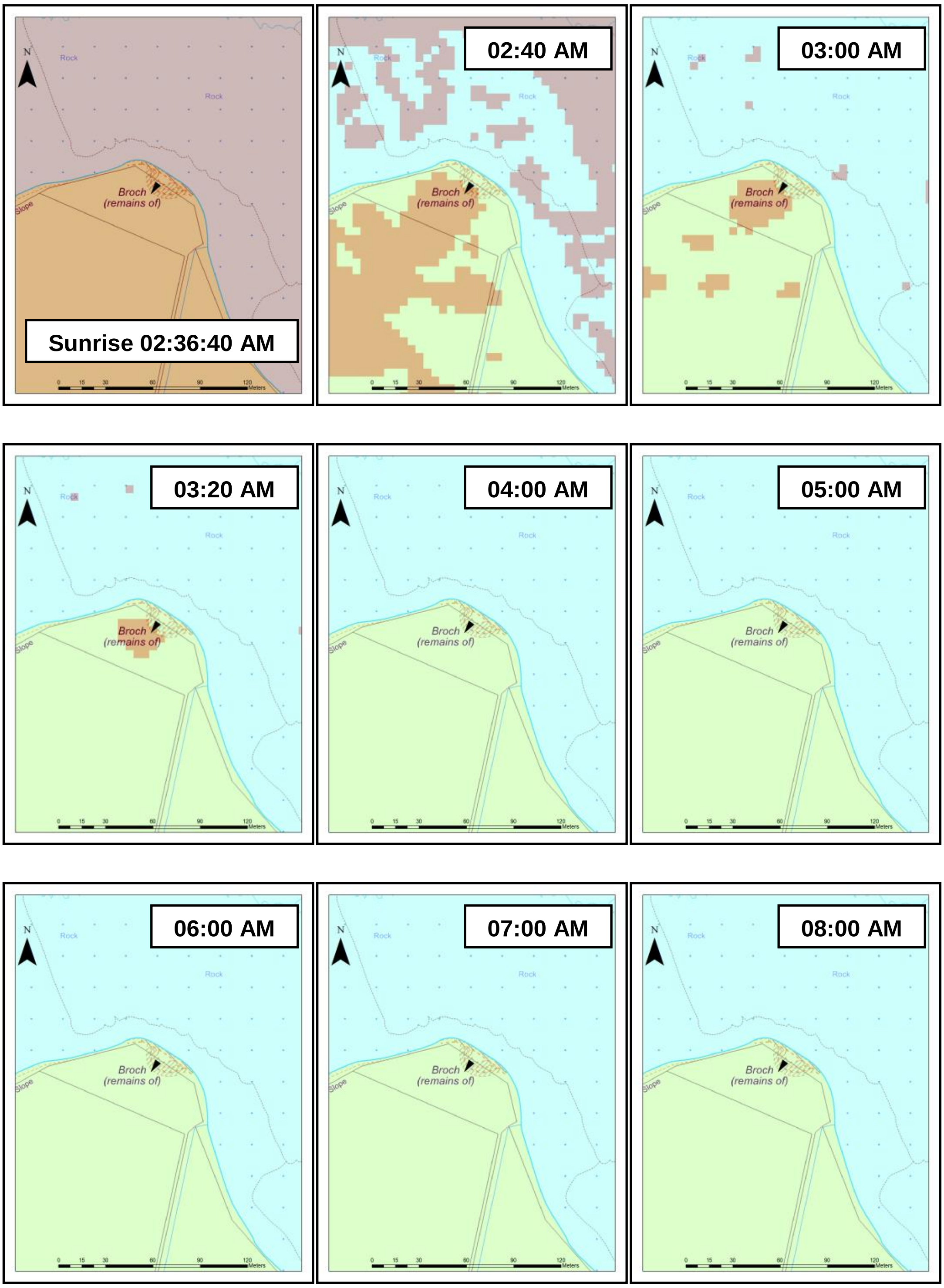


Figure 5.442. 09:00 AM to 17:00 PM around Ingshowe on the Summer Solstice (21st June). Red areas denote areas of shadow.

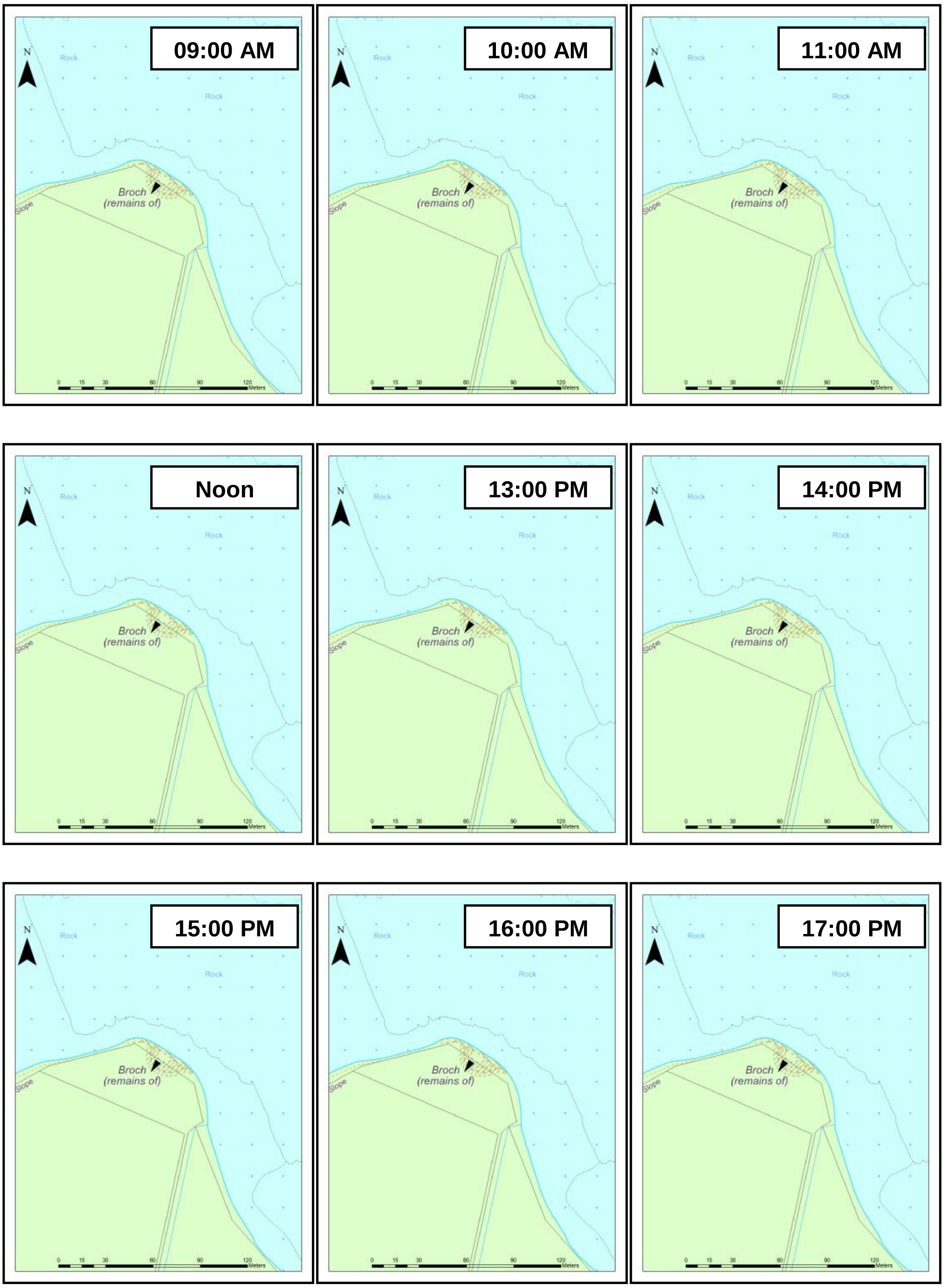
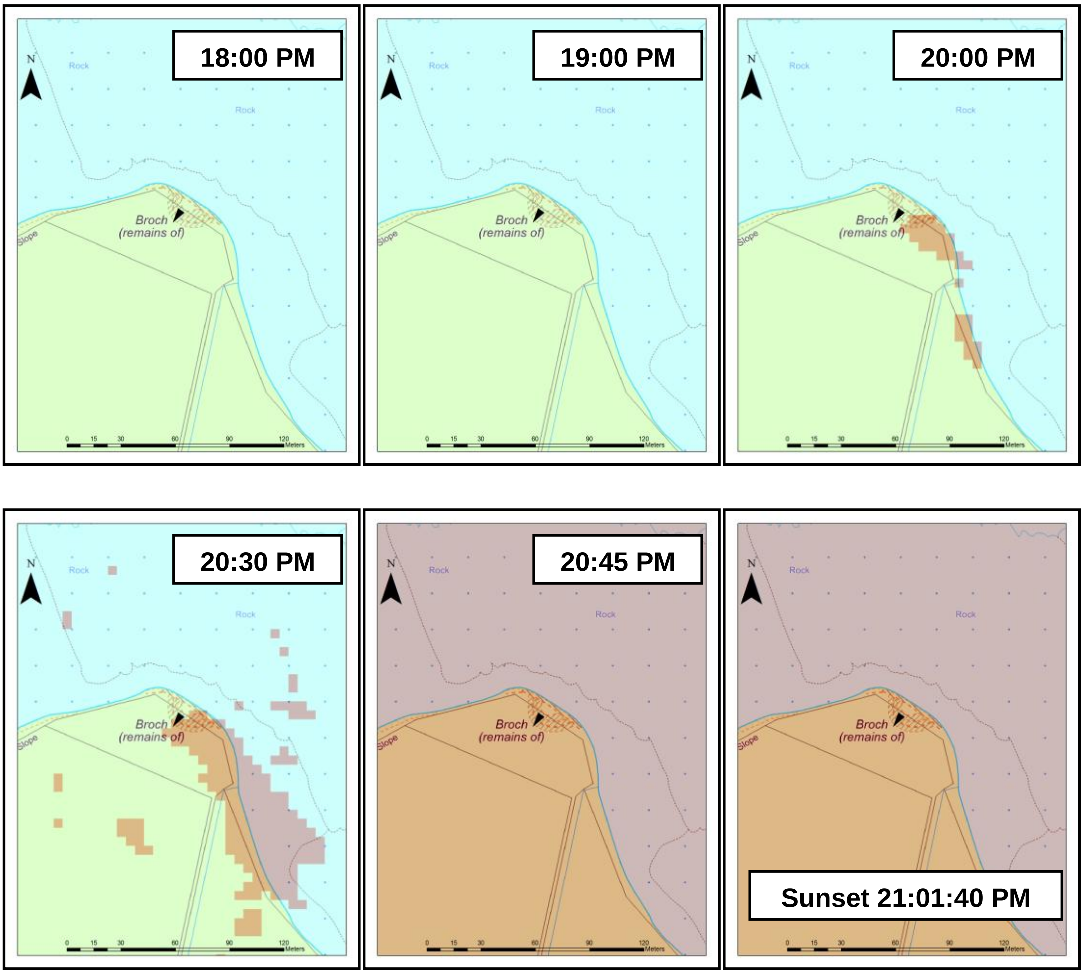


Figure 5.443. 18:00 PM to Sunset (21:01:40 PM) around Ingshowe on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 21: Midhowe

Canmore ID: 2286

Entrance: W

The Broch and its Landscape Context

Midhowe broch (Figure 5.444, 5.445, 5.446, 5.447 & 5.448) excavated between 1930 and 1933 (Callander and Grant 1934a; for further work, see: Brend 2010; Fojut 1993; Hedges 1987b: 110-116; MacKie 1994; Murray 2011; Sharman 2004), is one of the most impressive and well-preserved brochs in Orkney. The broch itself occupies the landward end of a small promontory, which falls down to the sea in a series of broad ledges, bounded on the SE and NW sides of the broch by the Stenchna Geo and the Geo of Brough, with the tower built in the centre of the promontory. Midhowe possesses little view of its own island, Rousay, but has an extensive northwards and southwards view over Eynhallow Sound (Figure 5.449), separating Orkney Mainland from Rousay; which means any boat approaching or leaving the sound would have been clearly visible from this broch. Midhowe also possesses very good views of other brochs bordering Eynhallow Sound, such as Gurness, Knowe of Stenso, and Costa Hill.

The Winter Solstice – Figures 5.450 and 5.451

The broch gains direct sunlight about half and hour after sunrise, and retains it until between 14:15 PM and 14:30 PM, about twenty to thirty minutes before sunset. Its due west entrance (a rare trait for Orcadian brochs) would not have been as suitable for the winter months as an entrance to the SE or SW however, and would have probably gained little light during this time of year.

The Equinox (21st March) – Figures 5.452 and 5.453

The western entrance is well suited to the spring and autumn months. Interestingly, the broch remains in shadow for over an hour after sunrise, probably gaining direct sunlight approximately an hour and twenty to thirty minutes after dawn break. The site then retains light until sunset. This means the western entrance would have framed the sun as it set. Unlike many brochs in Orkney which face E/SE, the due W entrance would have been noticeably more suitable.

The Summer Solstice (21st June) – Figures 5.454, 5.455 and 5.456

Again, the broch and its landscape do not receive direct light until over an hour and fifteen minutes after sunrise, gaining sunlight some time between 04:00 AM and 05:00 AM. The site then retains light for the day, until just before 20:30 PM, approximately twenty to twenty five minutes before sunset. The western entrance would have thus gained the maximum amount of light available.

Conclusions

Midhowe is interesting because it is one of few brochs in Orkney orientated towards the west rather than the east, however throughout the year, and especially during spring, summer and autumn, the western doorway would have admitted noticeably more light than an eastern doorway would have. The fact that the entrance does not face southwards also suggests a seasonal focus which, unlike most brochs in Orkney, was orientated away from the winter optimum. Midhowe and its features will be discussed in detail in Chapter Seven.

Figure 5.444. View from west facing entrance of Midhowe. Author's Photo.

Figure 5.445. Mid Howe Broch, Rousay, from the east.
Author's Photo.

Figure 5.446. View towards the south from Mid Howe.
Author's Photo.

Figure 5.447. View towards the east from Mid Howe.
Author's Photo.

Figure 5.448. Ground Plan of Mid Howe Broch, Rousay.
(Taken from: Callander and Grant 1934a: 515).

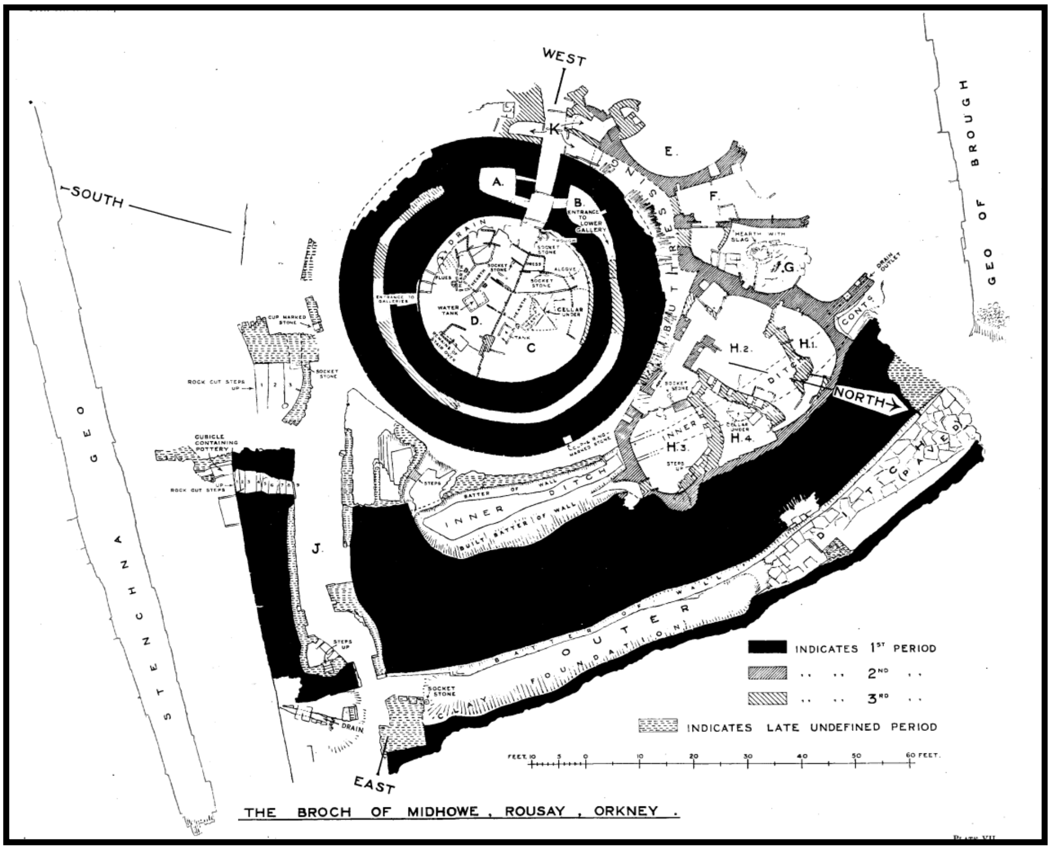


Figure 5.449. Viewshed of Midhowe.

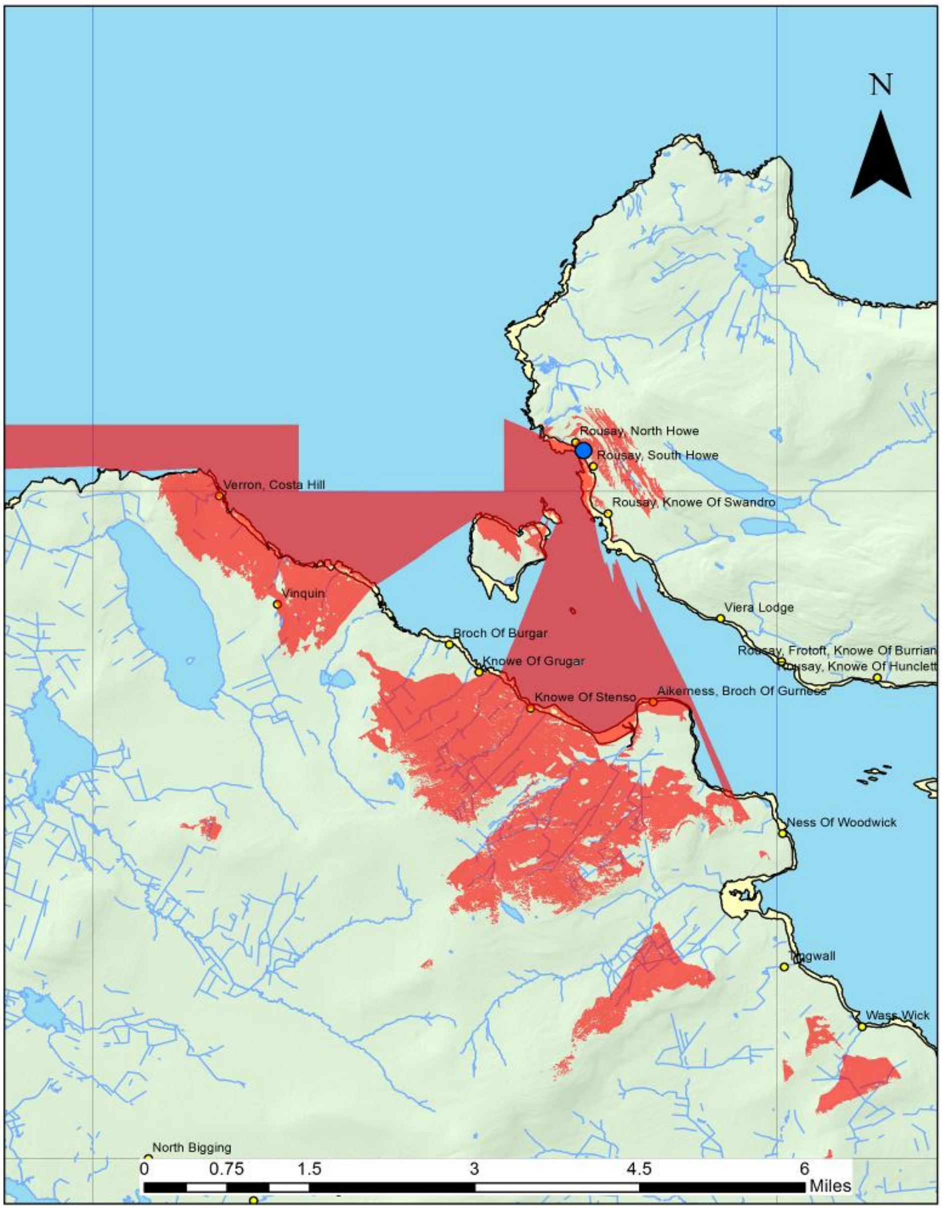


Figure 5.450. Sunrise (08:44 AM) to 13:00 PM around Midhowe on the Winter Solstice (21st December). Red areas denote areas of shadow.

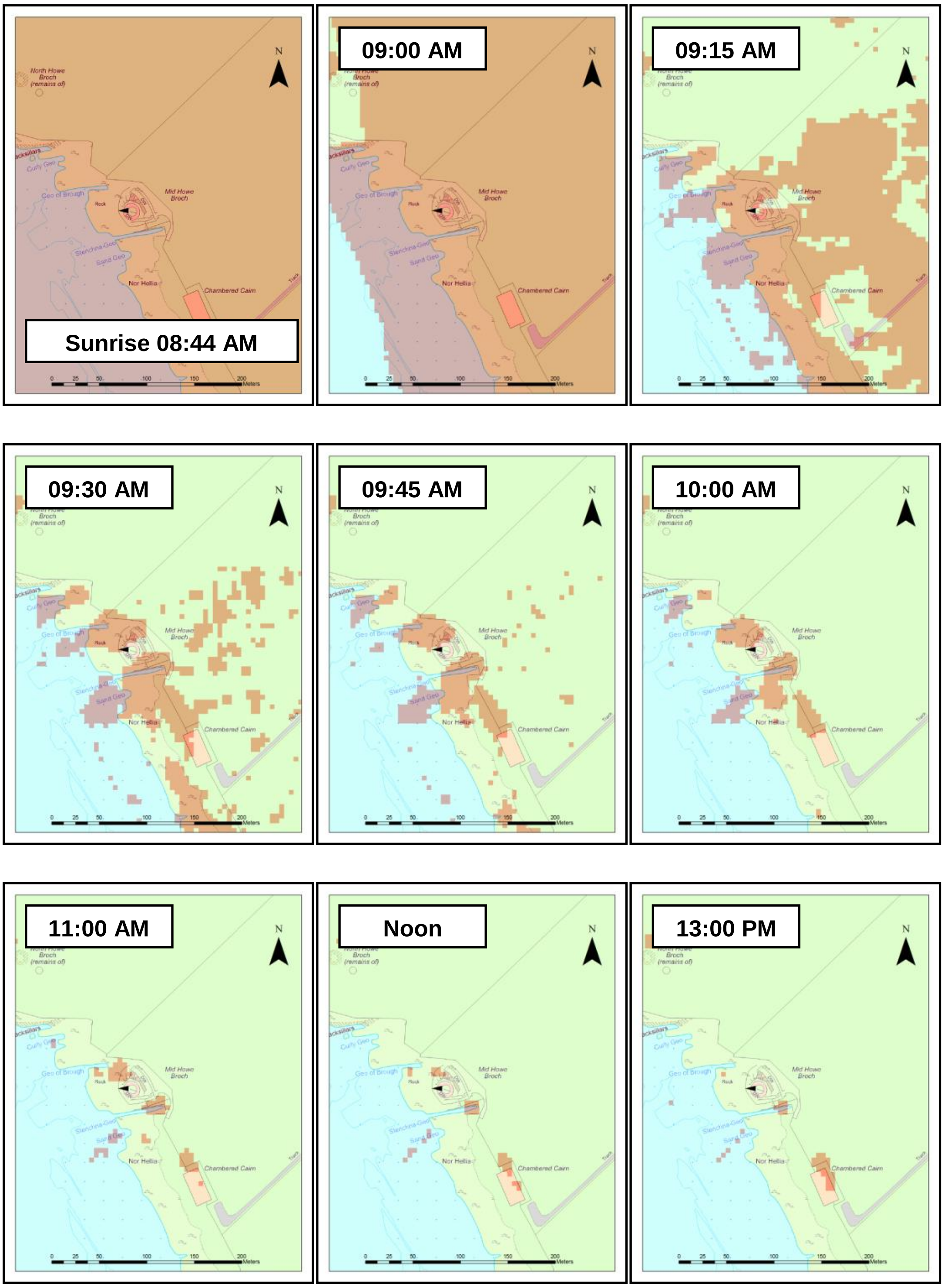


Figure 5.451.13:30 PM to Sunset (14:47 PM) around Midhowe on the Winter Solstice (21st December). Red areas denote areas of shadow.

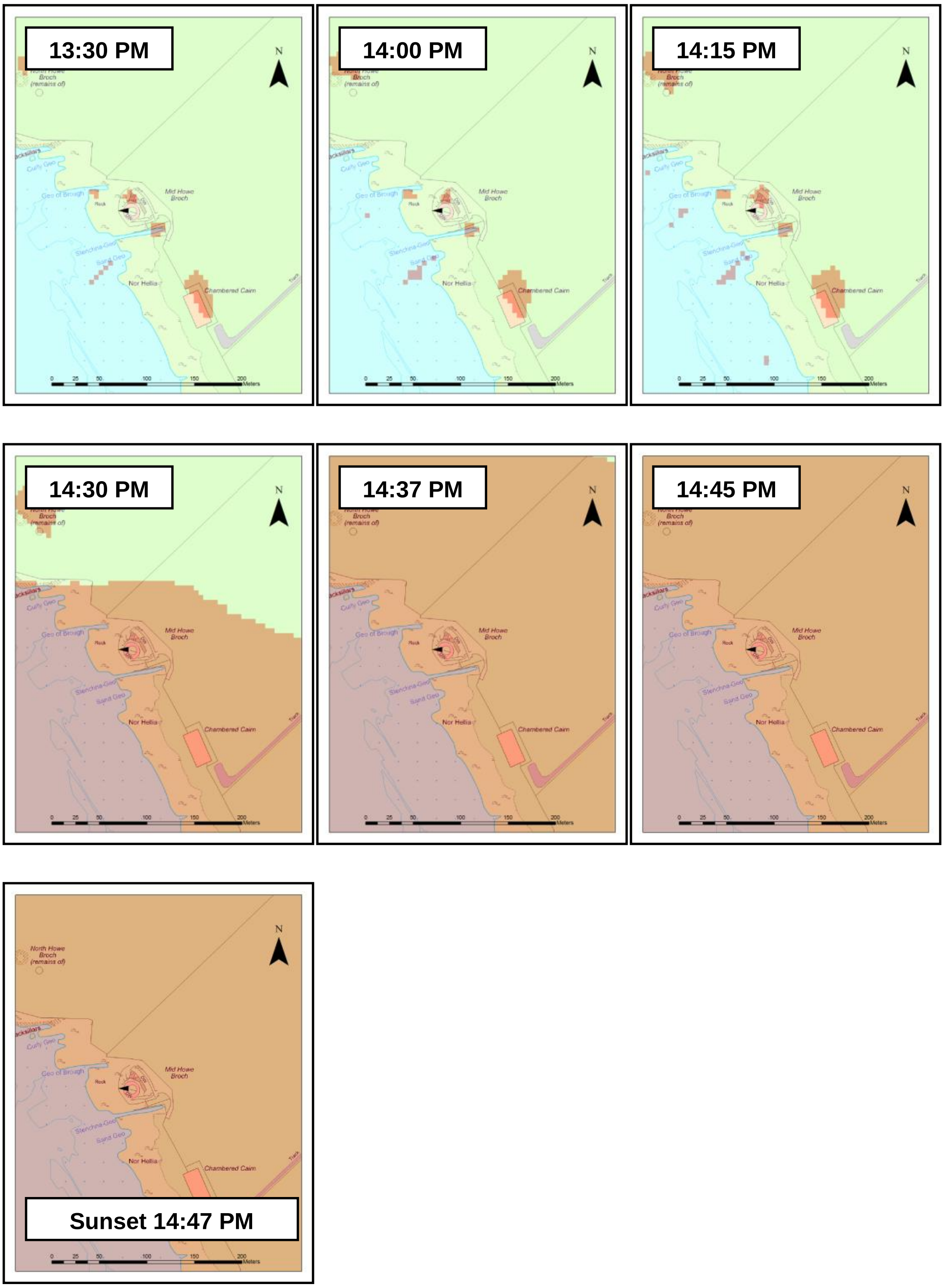


Figure 5.452. Sunrise (05:48 AM) to 11:00 AM around Midhowe on the Spring Equinox (21st March). Red areas denote areas of shadow.

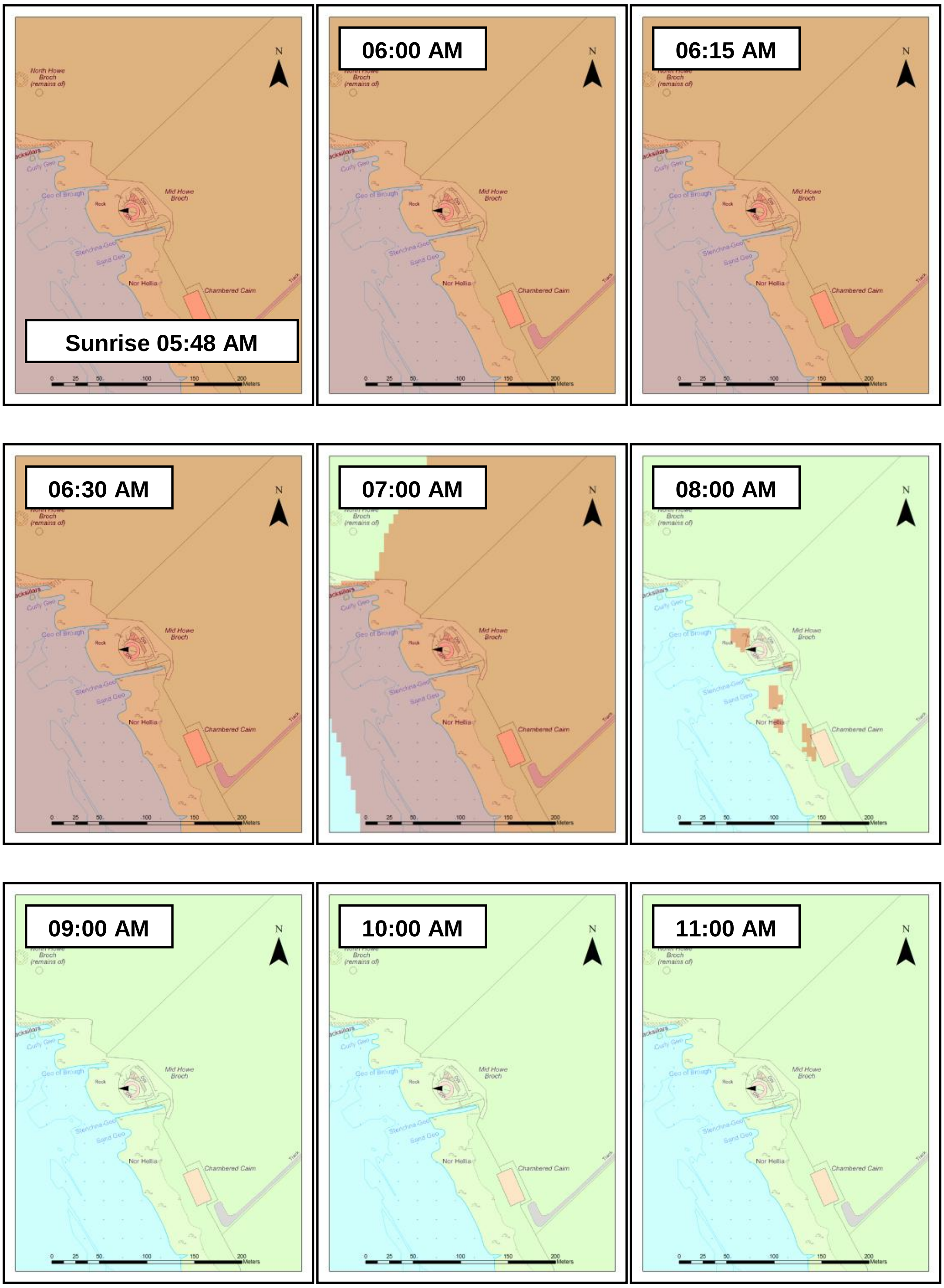


Figure 5.453. Noon to Sunset (18:02:15 PM) around Midhowe on the Spring Equinox (21st March). Red areas denote areas of shadow.

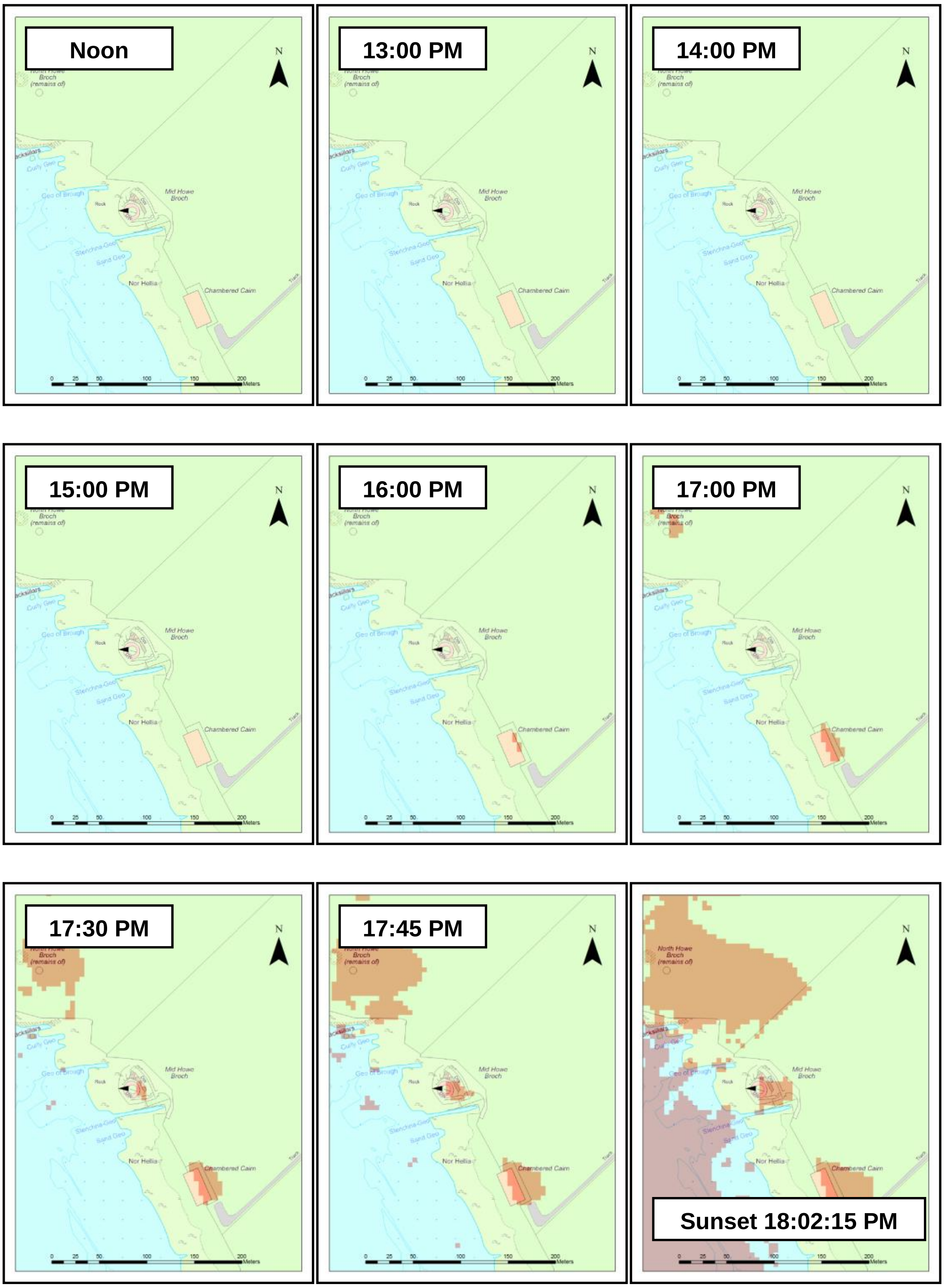


Figure 5.454. Sunrise (02:36:40 AM) to 09:00 AM around Midhowe on the Summer Solstice (21st June). Red areas denote areas of shadow.

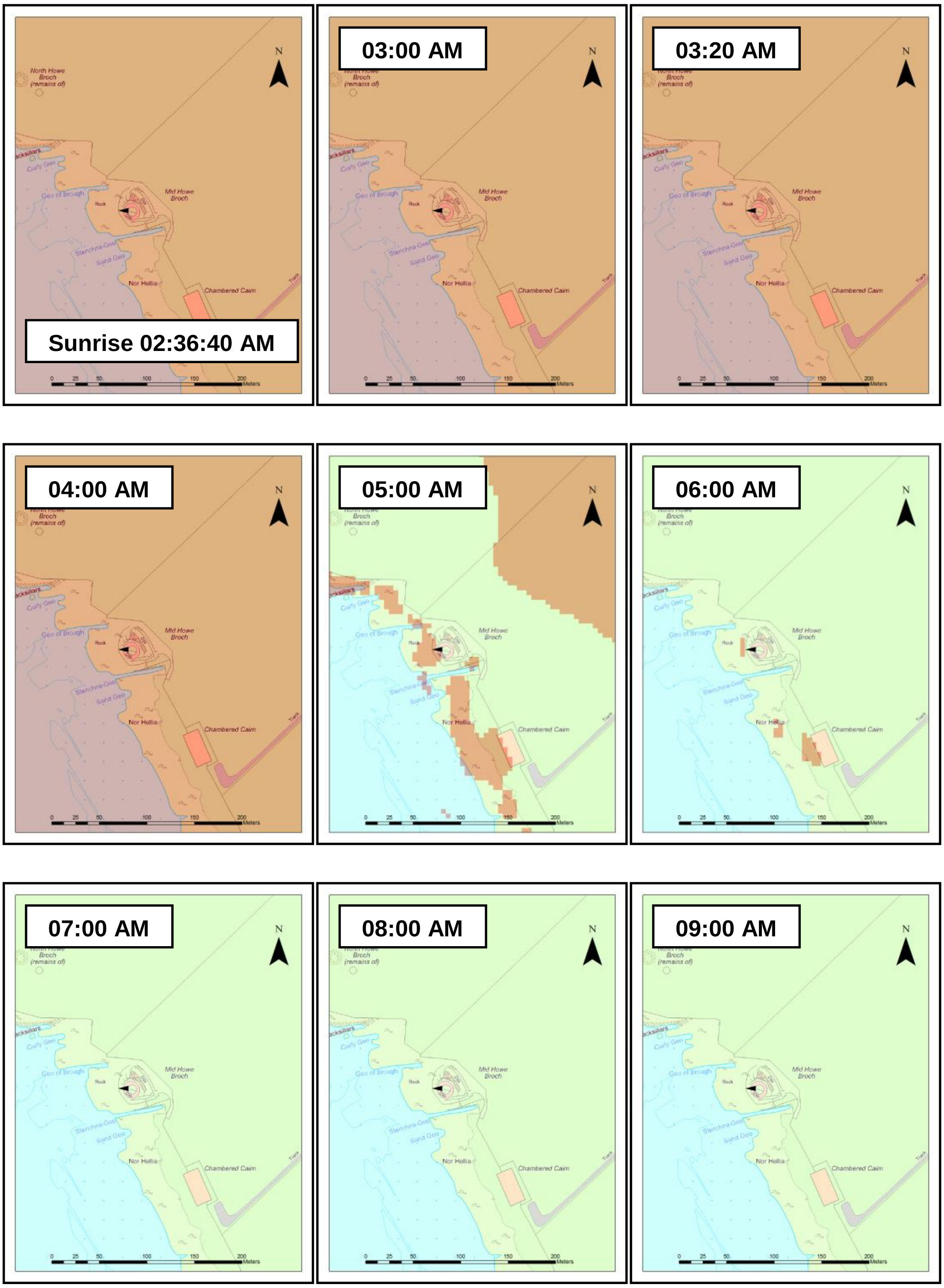


Figure 5.455. 10:00 AM to 18:00 PM around Midhowe on the Summer Solstice (21st June). Red areas denote areas of shadow.

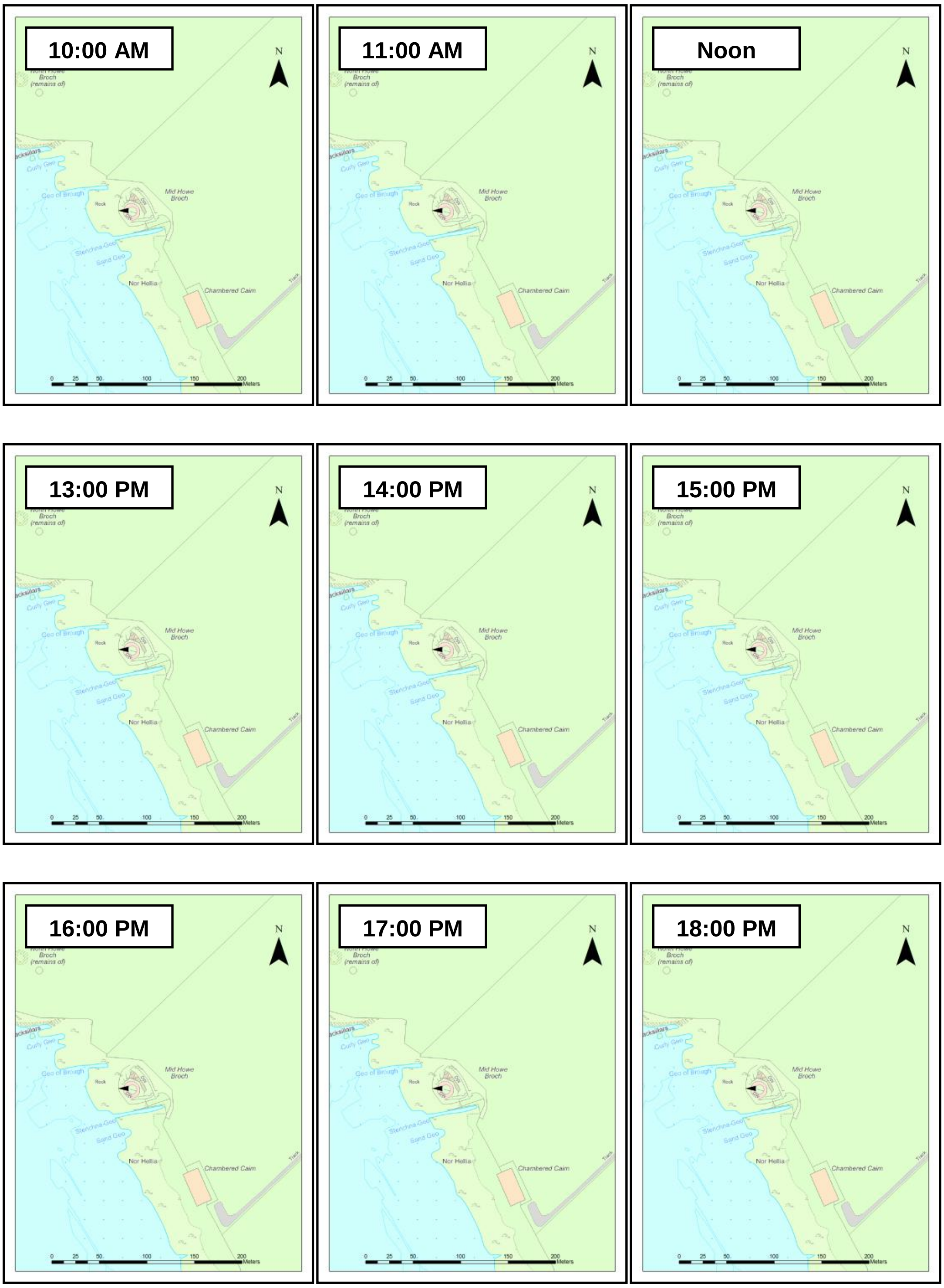
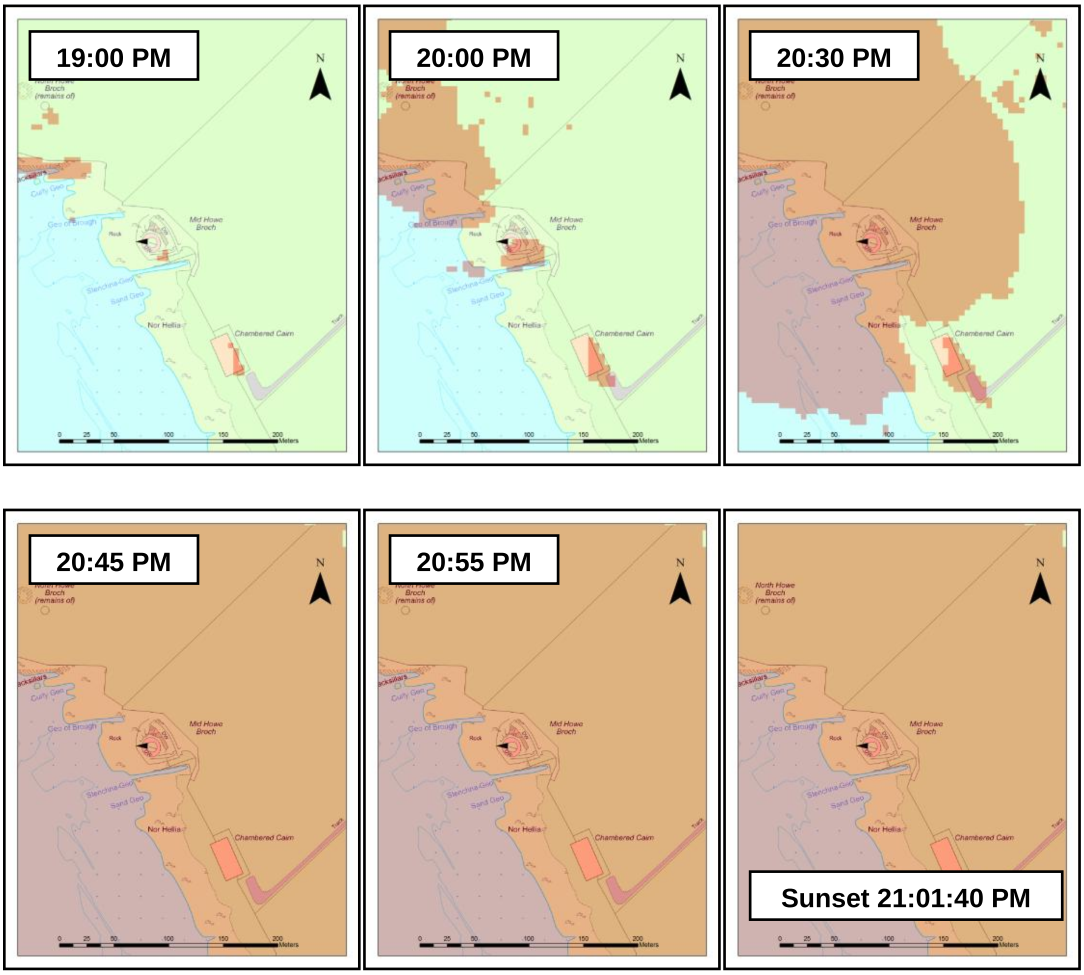


Figure 5.456. 19:00 PM to Sunset (21:01:40 PM) around Midhowe on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 22: Oxtro

Canmore ID: 1789

Entrance: W or NW

The Broch and its Landscape Context

Oxtro (Figures 5.457 and 5.458), excavated in 1847 (Petrie 1873: 76-78; also see: Hedges 1987b: 55-58), stands on flat ground near the Loch of Boardhouse, possessing no view towards any other broch in Orkney (Figure 5.459). It has an excellent view of the Loch of Boardhouse however, as well as the land around it, and has a limited view of the sea and the nearest bay to the north-west of the site. Part of the wall between due W and the NW arc had been destroyed before excavations, but this area doubtless contained the main entrance. As a guide, I shall use due W as the entrance.

The Winter Solstice – Figures 5.460 and 5.461

The broch gains direct sunlight within fifteen minutes after sunrise, and then retains it until just before 14:00 PM, probably losing light about an hour before sunset. The western entrance was thus not suited to this time of year, and a SE doorway would have been much more beneficial.

The Equinox (21st March) – Figures 5.462 and 5.463

The site gains direct sunlight within the first ten to fifteen minutes after sunrise, retaining it for the entire day, until sunset itself. Like Midhowe, the western doorway would have gained the maximum amount of light during spring and autumn, which an eastern entrance would have lost.

The Summer Solstice (21st June) – Figures 5.464, 5.465 and 5.466

Oxtro gains direct light within twenty minutes after sunrise, and retains it for the entire day, with the entrance again lit until sunset itself. Like in spring and autumn, the western entrance maximises available daylight.

Conclusions

Like Midhowe, Oxtro's western entrance is suitable in spring, autumn and summer, retaining the maximum amount of light possible, until sunset itself. However, this orientation would have sacrificed the important last hour of sunlight during winter. Like Midhowe, this suggests that western orientated brochs were not thought suitable for the winter months, and gained the most amount of light throughout the remainder of the year, and this could even be indicative of seasonal usage for western orientated sites.

Figure 5.457. Ground Plan of Oxtro Broch.
(After: Petrie 1873: 77; Fig. 5).

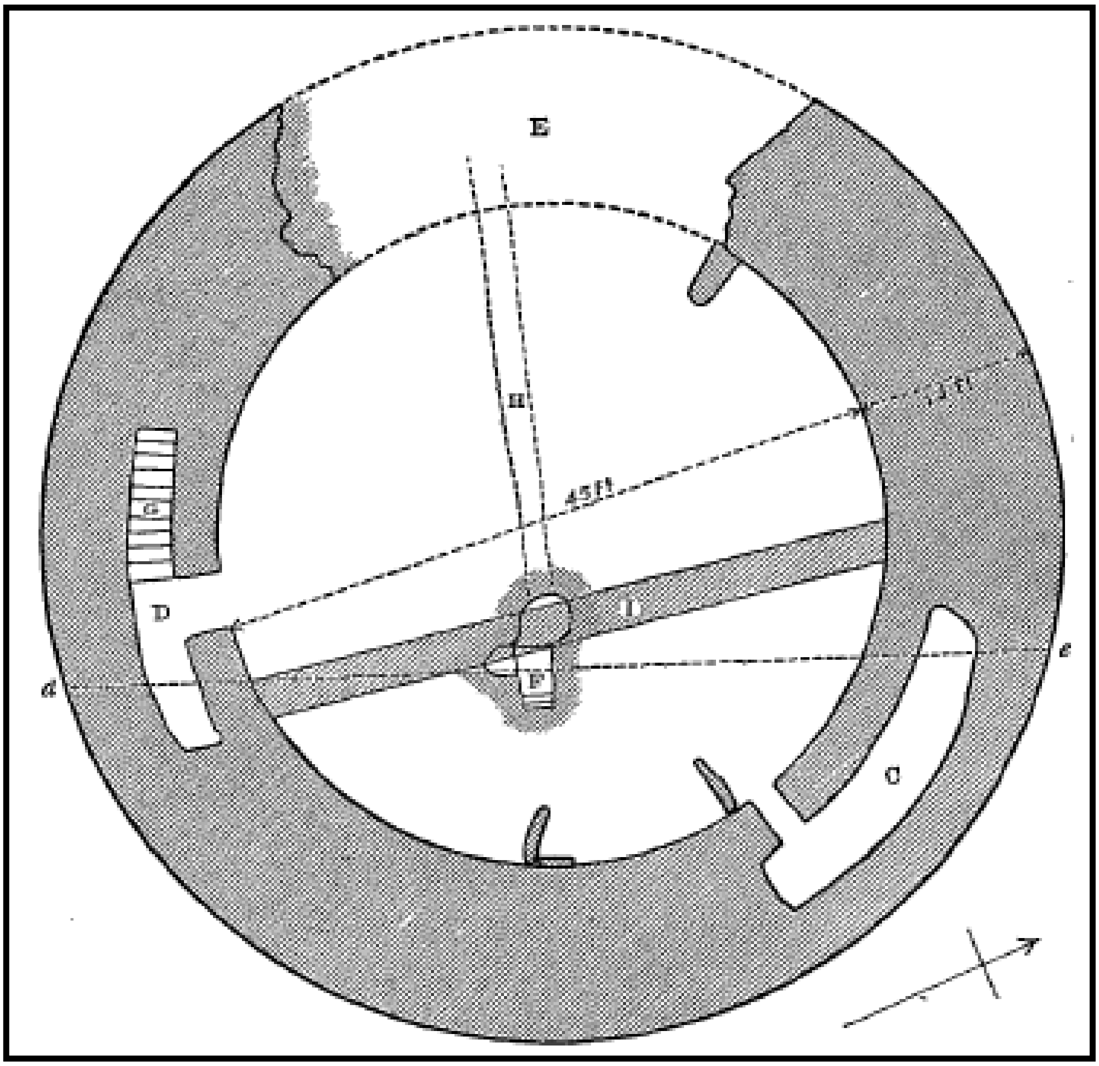


Figure 5.458. Oxtro Broch.
Author's Photo.

Figure 5.459. Multiple Viewsheds of Oxtro.

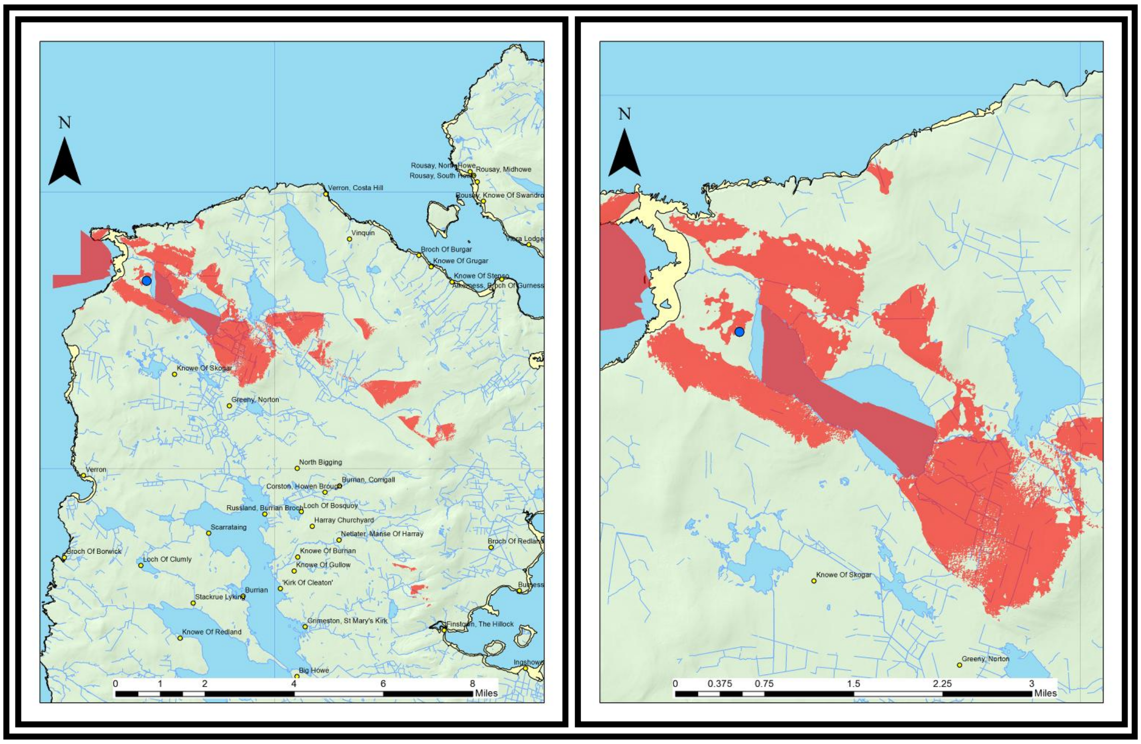


Figure 5.460. Sunrise (08:44 AM) to 13:00 PM around Oxtro on the Winter Solstice (21st December). Red areas denote areas of shadow.

Figure 5.461. 13:30 PM to Sunset (14:47 PM) around Oxtro on the Winter Solstice (21st December). Red areas denote areas of shadow.

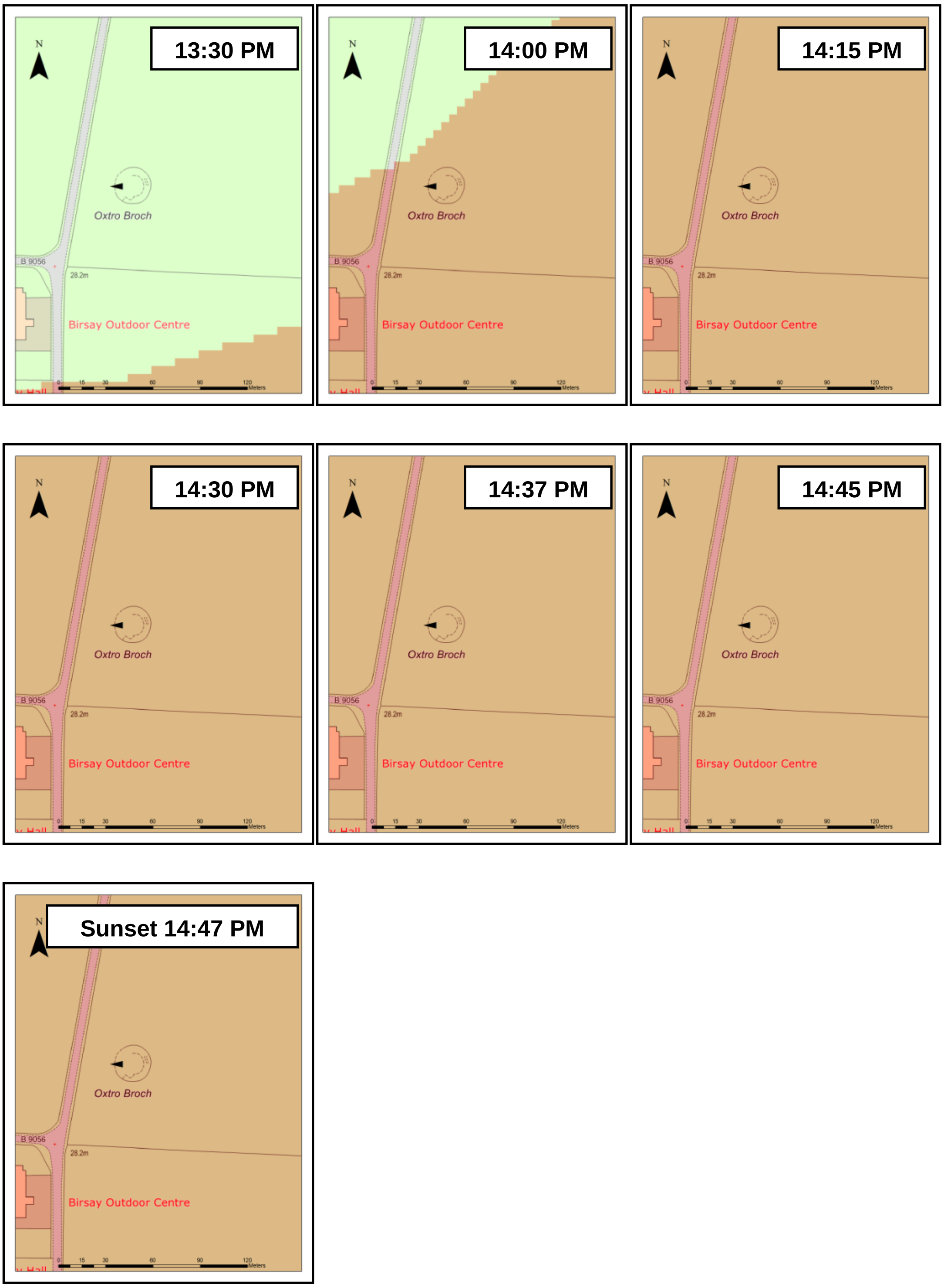


Figure 5.462. Sunrise (05:48 AM) to 11:00 AM around Oxtro on the Spring Equinox (21st March). Red areas denote areas of shadow.

Figure 5.463. Noon to Sunset (18:02:15 PM) around Oxtro on the Spring Equinox (21st March). Red areas denote areas of shadow.

Figure 5.464. Sunrise (02:36:40 AM) to 09:00 AM around Oxtro on the Summer Solstice (21st June). Red areas denote areas of shadow.

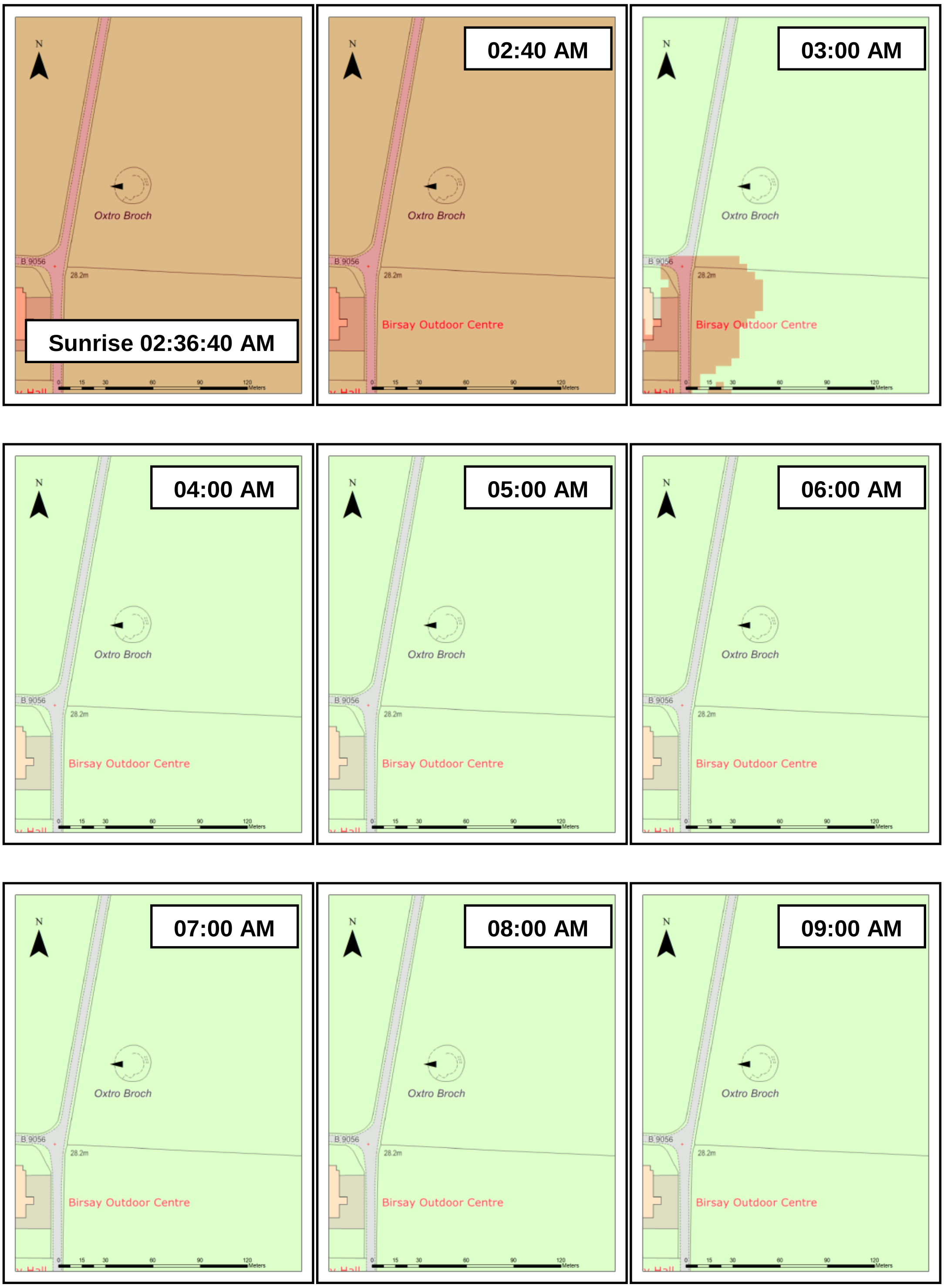
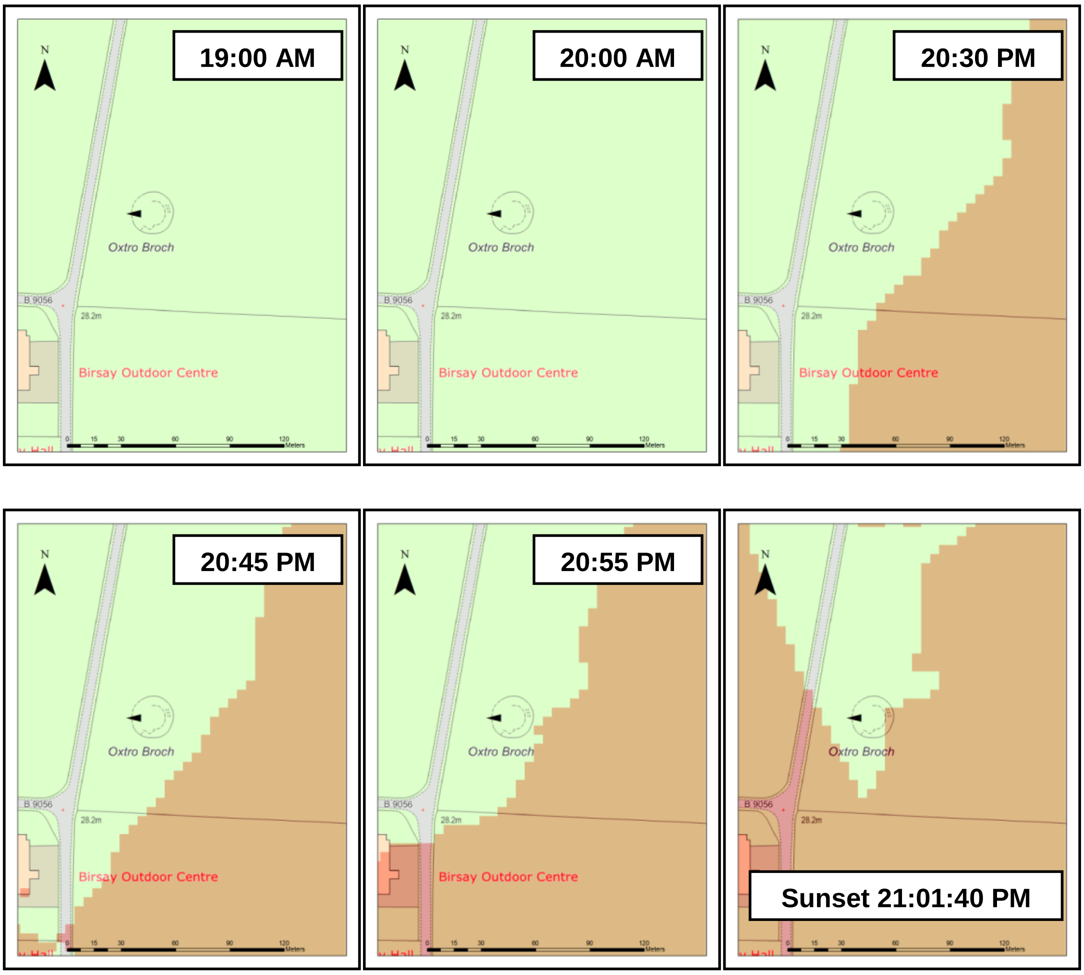


Figure 5.465. 10:00 AM to 18:00 PM around Oxtro on the Summer Solstice (21st June). Red areas denote areas of shadow.

Figure 5.466. 19:00 PM to Sunset (21:01:40 PM) around Oxtro on the Summer Solstice (21st June). Red areas denote areas of shadow.



Broch 23: Lamb Head

Canmore ID: 3350

Entrance: NW

The Broch and its Landscape Context

Lamb Head broch (Figure 5.467), with only its NW facing entrance now surviving (Thomas 1852: 123, 130; MacKie 2002a: 251-252; RCAHMS 1946: 328), stands on high cliffs in the SE corner of Stronsay, and because of this position, it has an extensive view of the sea towards the western side of Mainland and Sanday (Figure 5.468). It also has views of Rousay, the hills on the eastern side of Mainland Orkney, and even Hoy. Any boat travelling northwards through the islands would have thus been visible.

The Winter Solstice – Figures 5.469 and 5.470

Unusually for Orkney, this broch faces NW, and so its entrance would have only gained direct sunlight during the summer months. However, the broch actually gains light on its SE side fifteen minutes after sunrise, retaining it until a couple of minutes before sunset.

The Equinox (21st March) – Figures 5.471 and 5.472

During spring and autumn, the broch gains direct light at sunrise, retaining it until only a minute before sunset. Again then, a due eastern or western doorway would have been more suitable, though the entrance in the NW would have probably gained a little direct light towards the very end of the day.

The Summer Solstice (21st June) Figures 5.473, 5.474 and 5.475

Again, the broch gains direct light at sunrise, retaining it for the entire day until the last fifteen minutes before sunset. The entrance would have probably gained a little light at the end of the day, however, an entrance to the NE would have gained light at dawn, and so the choice of NW for the entrance is odd.

Conclusions

As the entrance loses light throughout much of the year, and loses more direct light than a NE doorway would have in summer, it may be that this doorway was marking the setting sun of the summer solstice. The doorway does, however, face the easiest approach onto this small peninsula.

Figure 5.467. Plan of the NW facing Entrance of Lamb Head Broch. (Crown Copyright: RCAHMS)

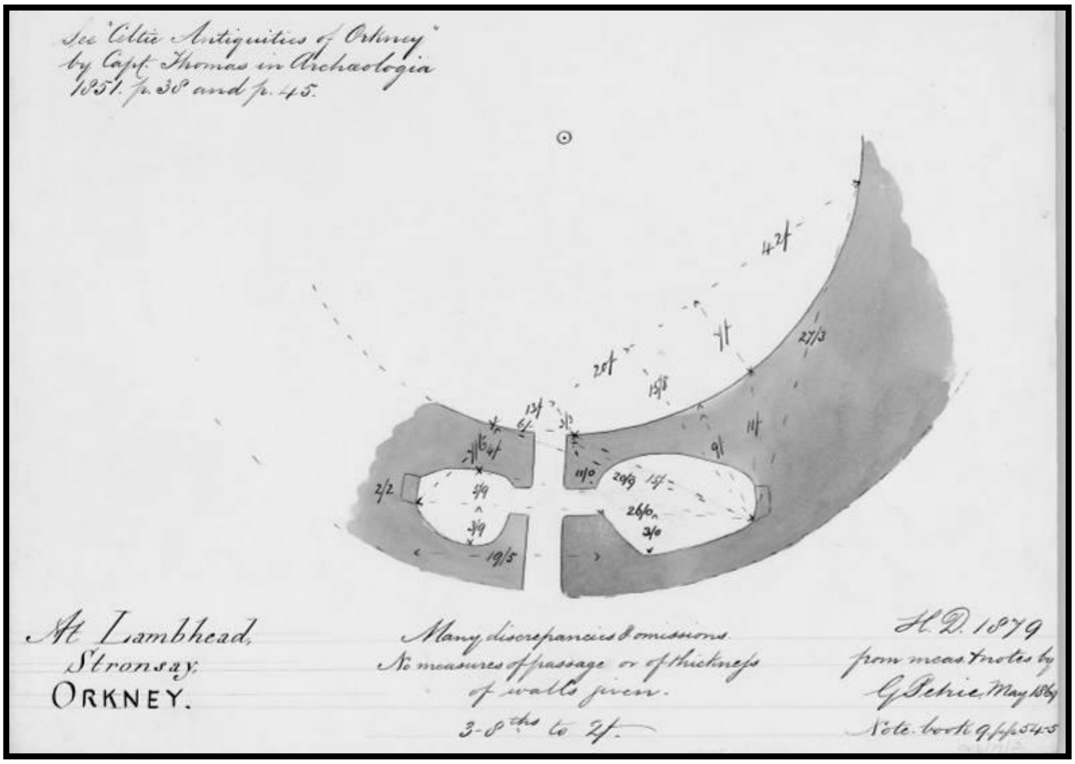


Figure 5.468. Multiple Viewsheds of Lamb Head.

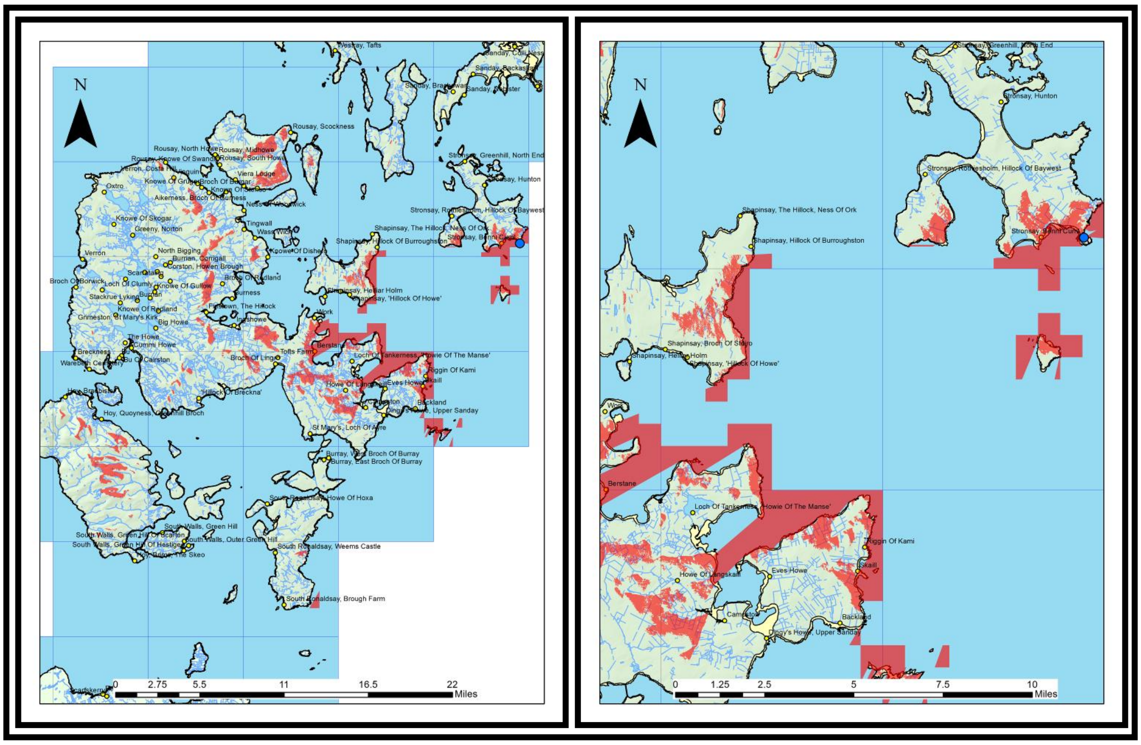


Figure 5.469. Sunrise (08:44 AM) to 13:00 PM around Lamb Head on the Winter Solstice (21st December). Red areas denote areas of shadow.

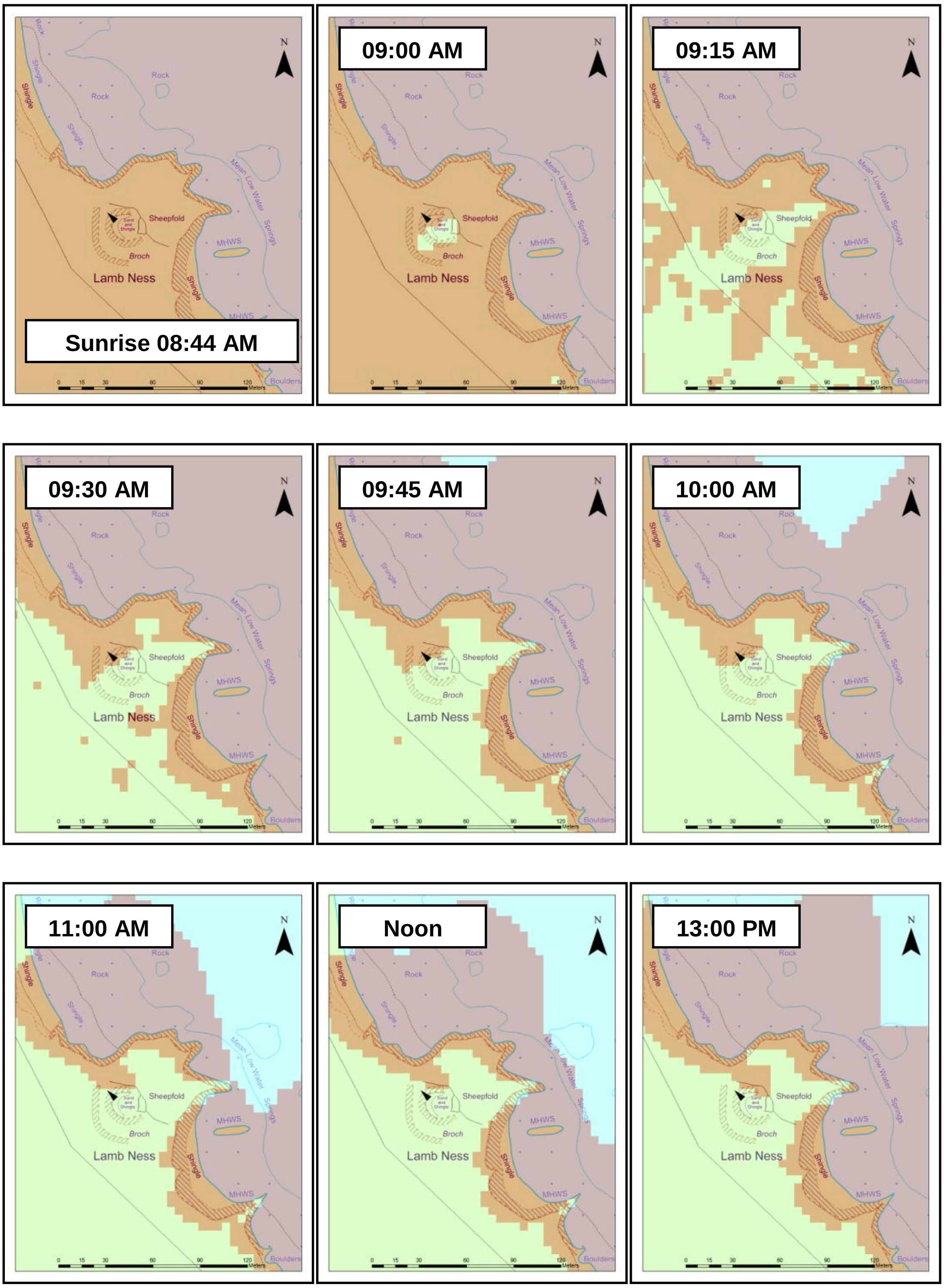


Figure 5.470. 13:30 PM to Sunset (14:47 PM) around Lamb Head on the Winter Solstice (21st December). Red areas denote areas of shadow.

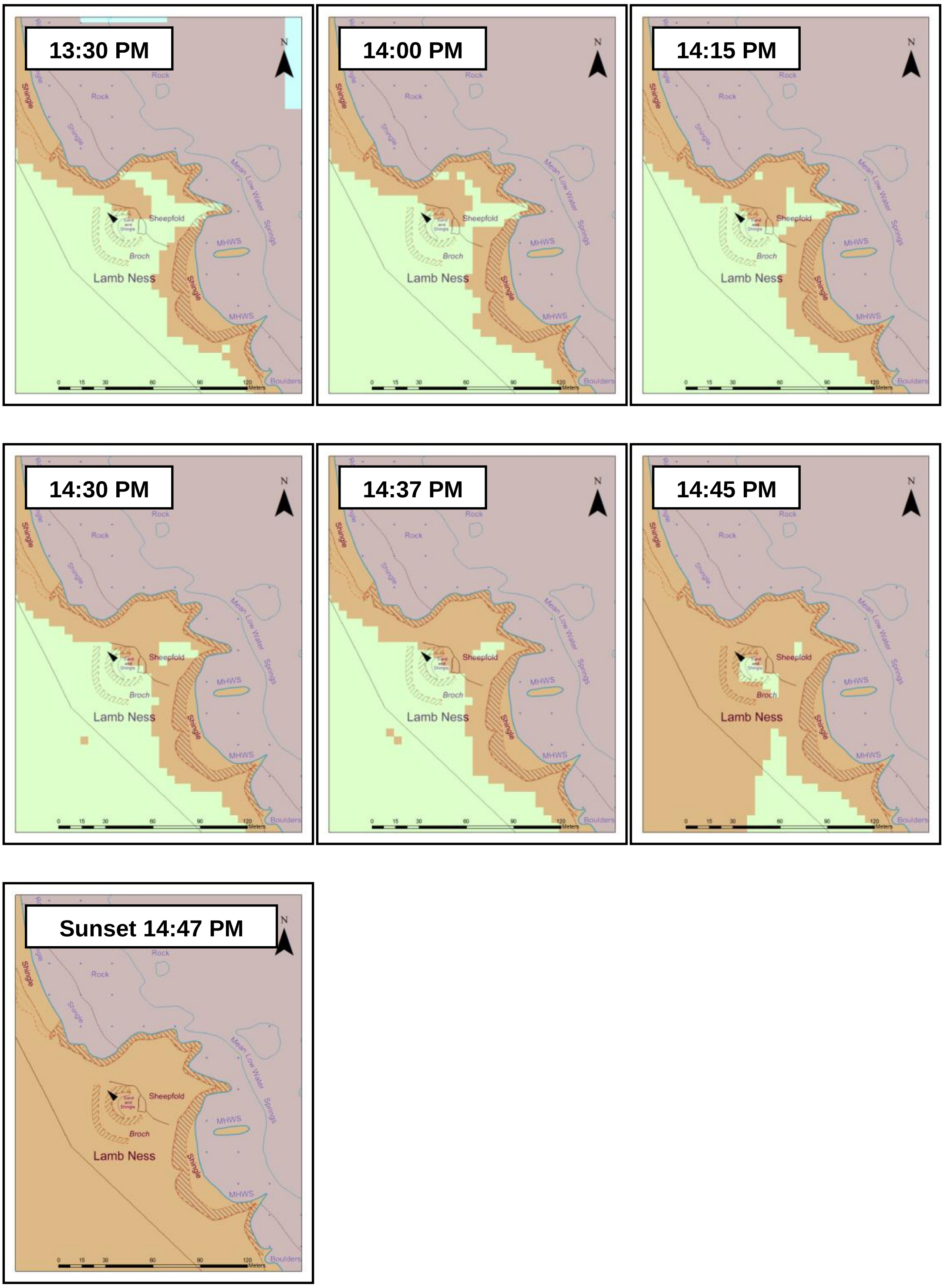


Figure 5.471. Sunrise (05:48 AM) to 11:00 AM around Lamb Head on the Spring Equinox (21st March). Red areas denote areas of shadow.

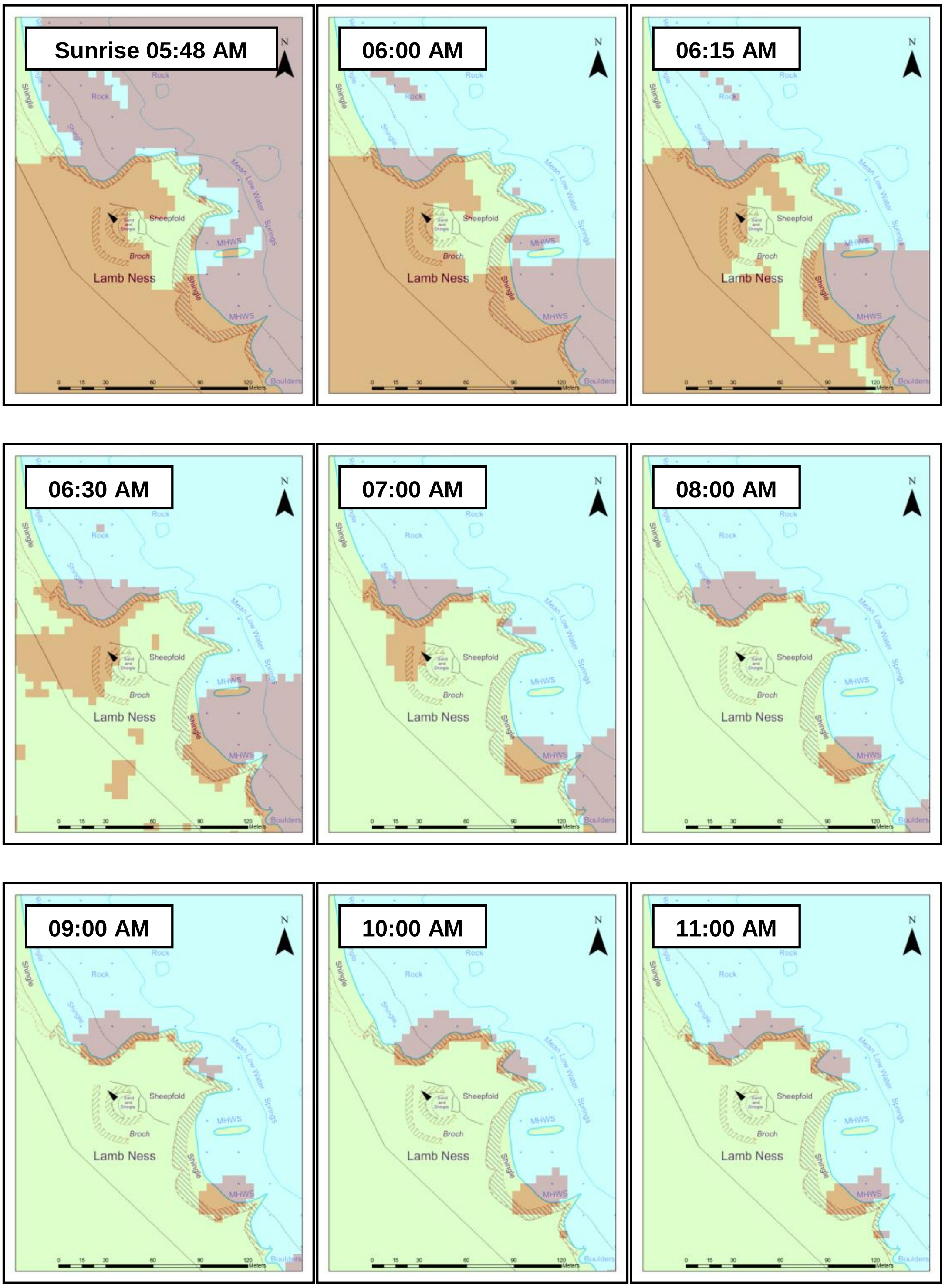


Figure 5.472. Noon to Sunset (18:02:15 PM) around Lamb Head on the Spring Equinox (21st March). Red areas denote areas of shadow.

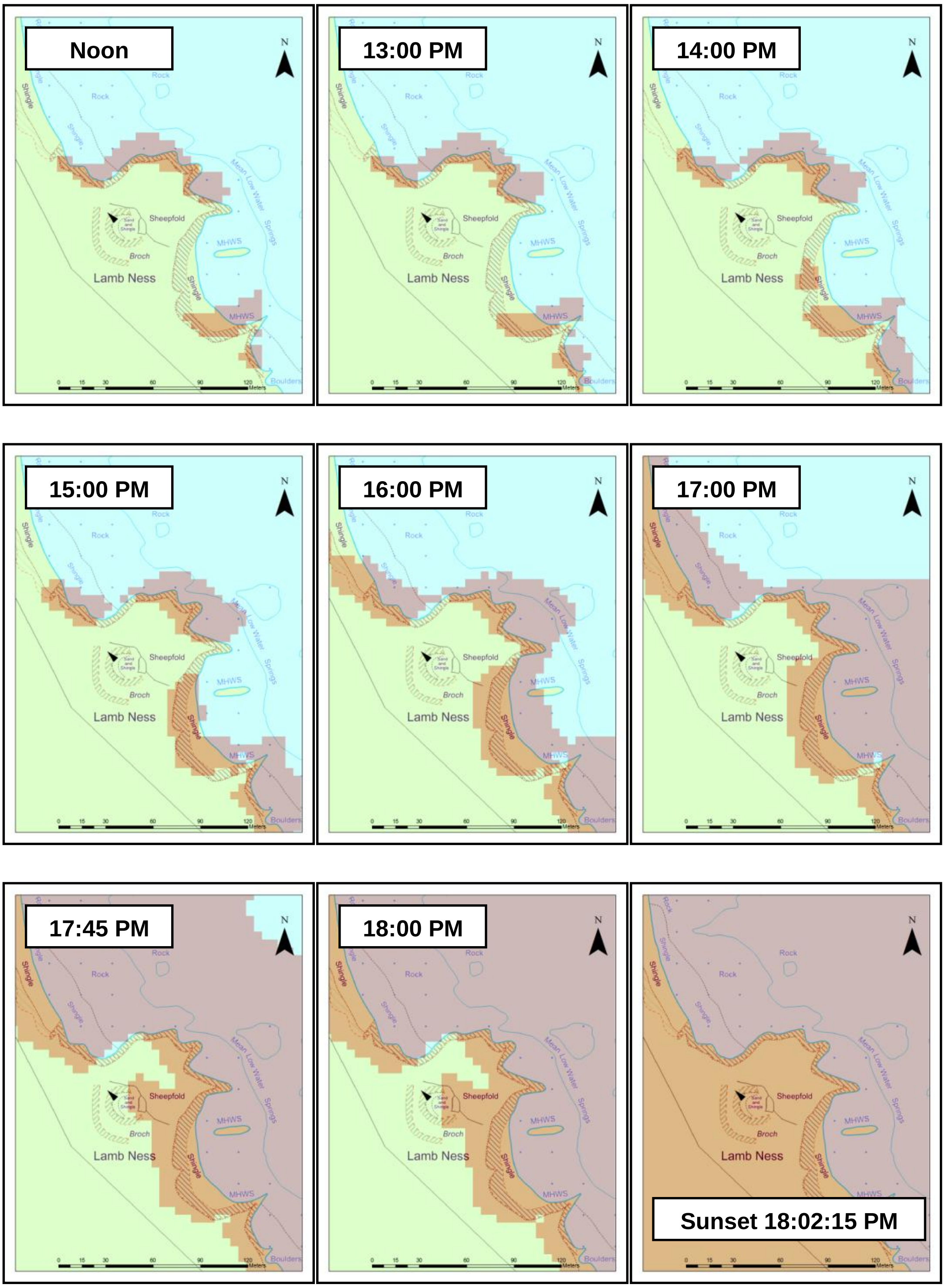


Figure 5.473. Sunrise (02:36:40 AM) to 08:00 AM around Lamb Head on the Summer Solstice (21st June). Red areas denote areas of shadow.

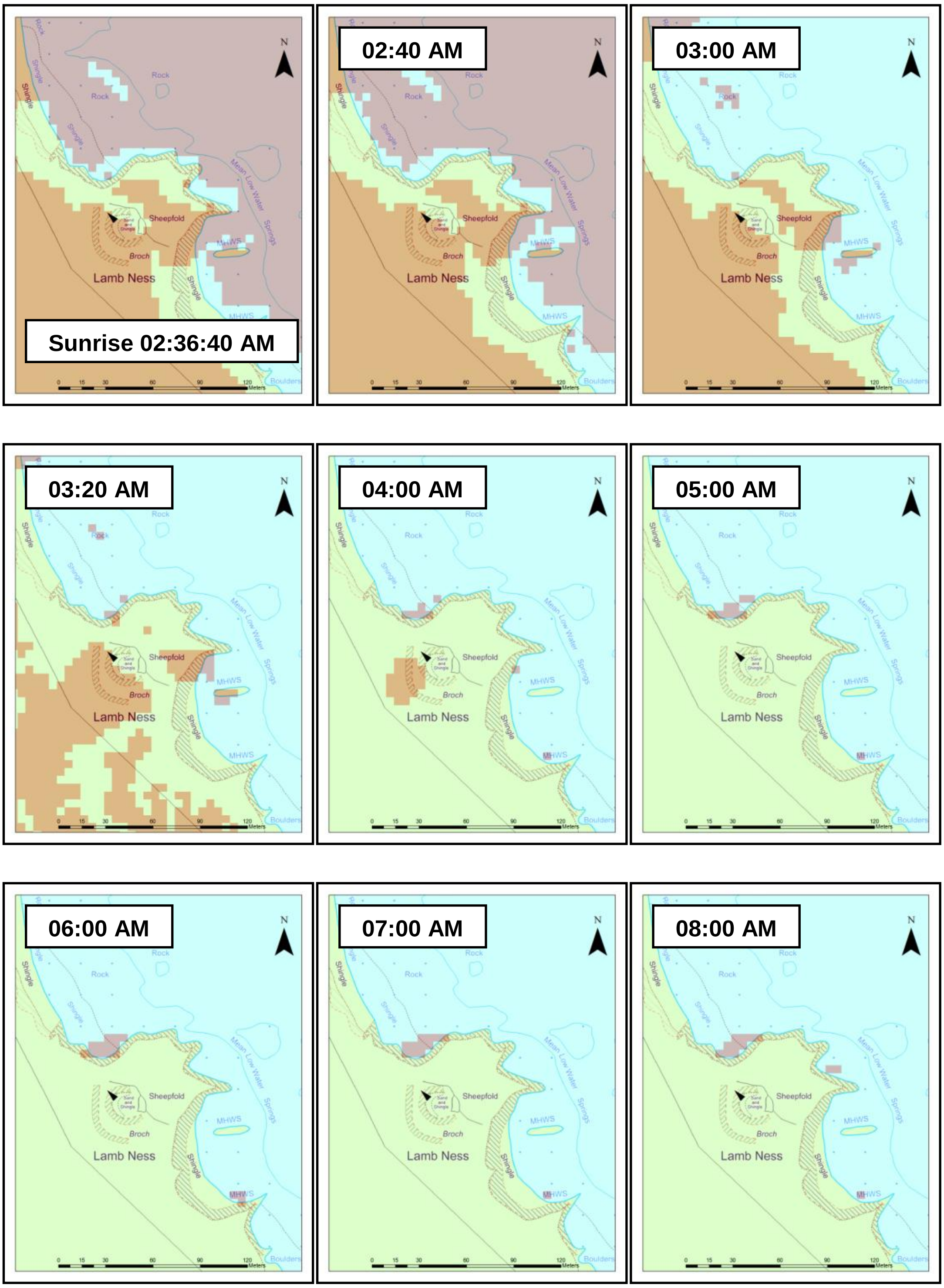


Figure 5.474. 09:00 AM to 17:00 PM around Lamb Head on the Summer Solstice (21st June). Red areas denote areas of shadow.

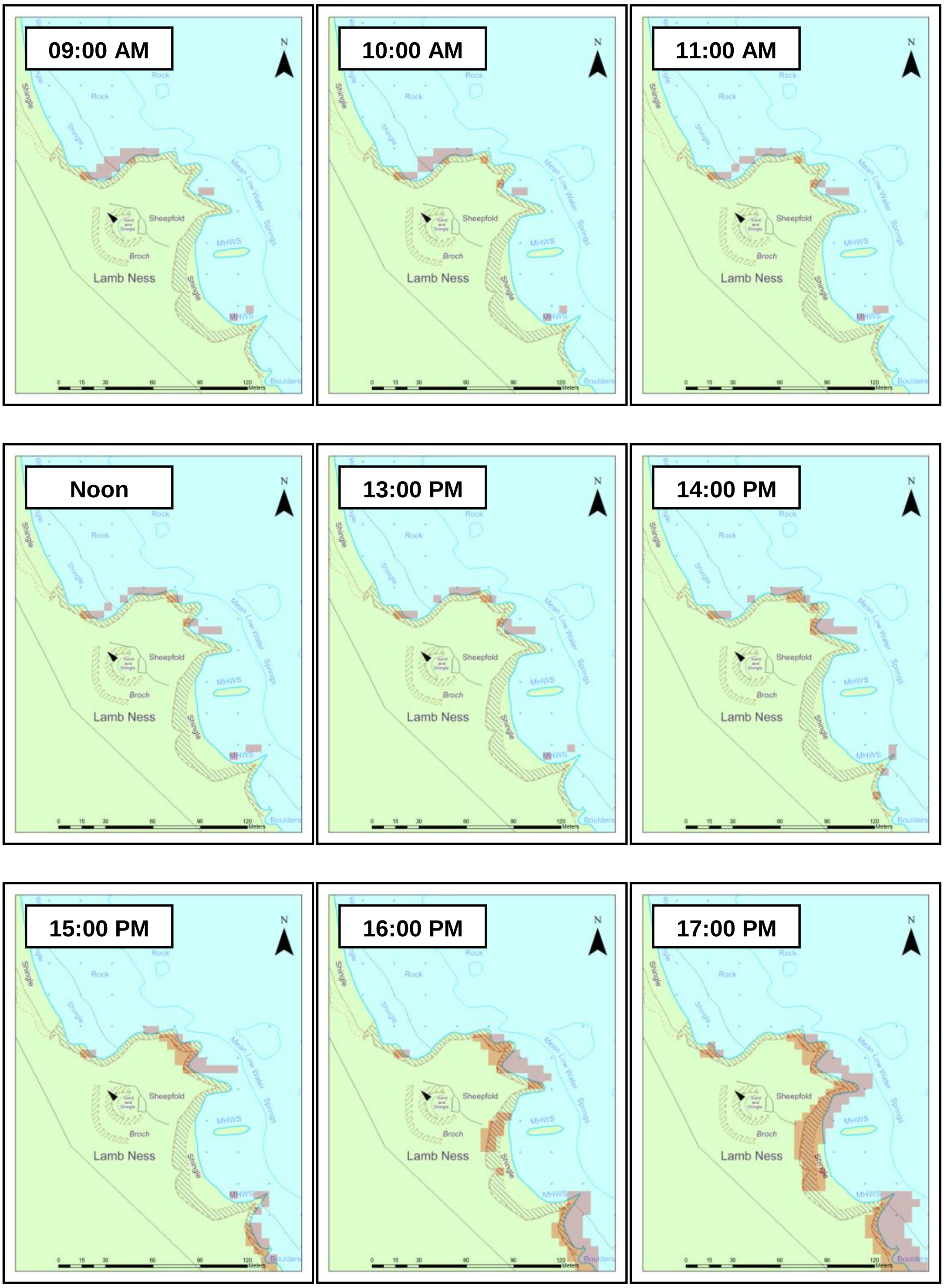
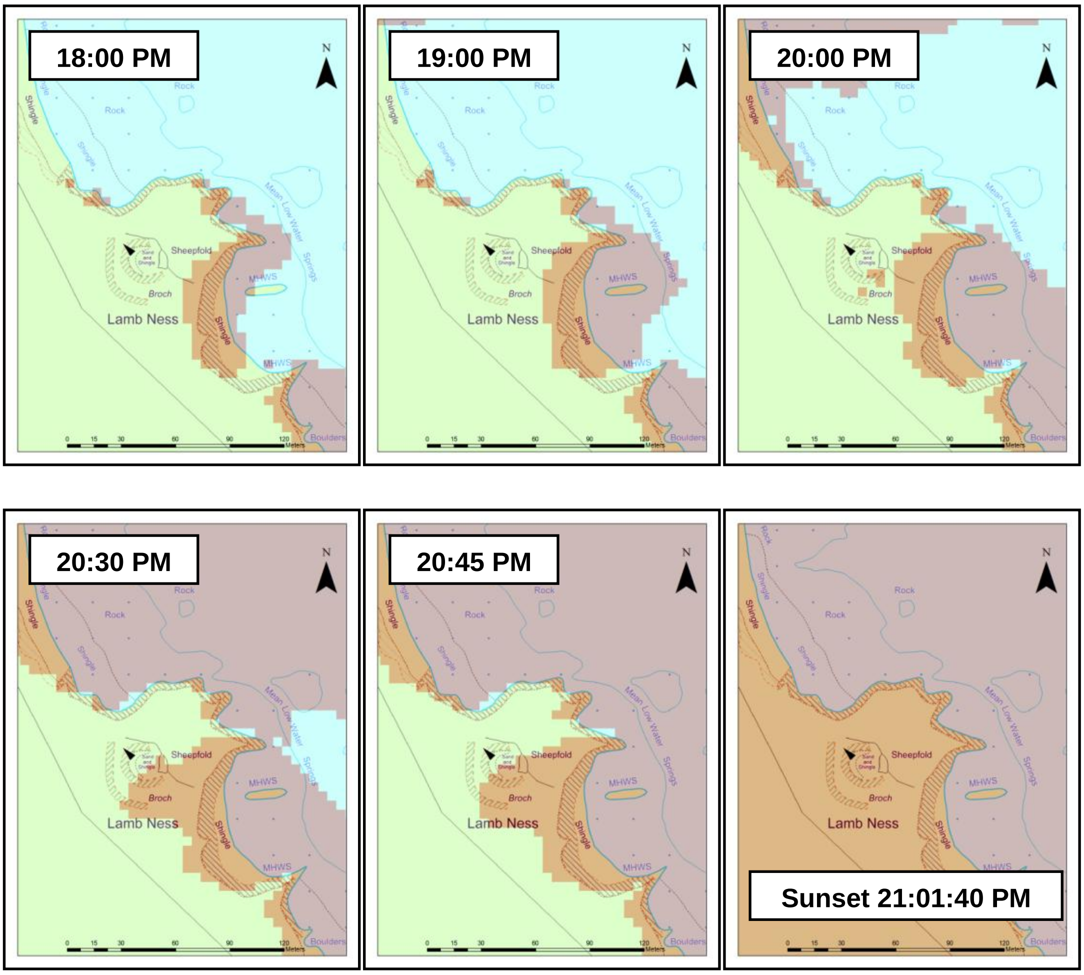


Figure 5.475.18:00 PM to Sunset (21:01:40 PM) around Lamb Head on the Summer Solstice (21st June). Red areas denote areas of shadow.



Orkney: Interpretation and Discussion

Table 5.2. Comparison between Actual and Optimum Broch Orientations in Orkney.

Broch	Broch Orientation	Optimum Orientation for Broch Location (for all year light availability)	Does the Broch Face the Light Optimum?
Howe of Langskaill	ENE	W	No
East Broch of Burray	E	E/SE	Yes
Hillock of Burroughston	E	E	Yes
Broch of Gurness	E	W/SW	No
Burrian Broch	E	E/W	Yes
Knowe of Redland	E	E/W	Yes
Loch of Ayre	ESE	E/SE/W/SW	Yes
Howe of Hoxa	ESE	WSW/SW	No
Scockness	SE	E/SE	Yes
Broch of Lingro	SE	E/SE	Yes
Bu	SE	E/SE	Yes
Broch of Burrian	SE	E/SE	Yes
Manse of Harray	SE	W	No
Broch of Borwick	SE	W	No
Munkerhoose	SE	W/SW	No
Howie of the Manse	SE	E/SE	Yes
The Howe	SE	E/SE	Yes
Dingy's Howe	SE	E/SE/W/SW	Yes
Riggin Of Kami	SSW	E/SE	No
Ingshowe	SW	E/SE	No
Midhowe	W	W/SW	Yes
Oxtro	W or NW	SE/W	Yes
Lamb Head	NW	E/W	No

Orkney's orientation pattern generally supports an E/SE tradition in these islands; something unseen elsewhere in Scotland. At first, this suggests that the ideas put forward in the cosmological model regarding appropriate eastward orientation (relating to the rising sun, and sunwise movement in general) were strong here. However, the situation is clearly not as simple as that.

Out of a total of twenty-three brochs in Orkney, nine are not orientated towards the optimum direction for light availability throughout the year, five less than Shetland. Like the Loch of Brindister, Hawks Ness and Loch of Snabrough in Shetland, two brochs in Orkney (Howe of Langskaill and Lamb Head) face northwards, thereby forfeiting light throughout much of the year. Both of these gain ample amounts of direct sunlight on their western, southern and eastern sides however, and so their orientations seem illogical. For whatever reason then, a 'normal' orientation was not appropriate. Similarly, for other brochs (e.g. Loch of Ayre, Burrian Broch, Knowe of Redland), E and W would have provided roughly the same amount of light for a doorway, and yet despite this, it would seem that due E was often chosen over due W, thus suggesting either an avoidance of the SW prevailing winds, or a clear desire to avoid the west in general.

This avoidance is alluded to in the orientation of Gurness. Because its entrance faces E, Gurness loses noticeably more light than a western entrance would; thereby suggesting either a desire for morning sunlight only, or, as the western facing broch of Midhowe is located just across Eynhallow Sound from Gurness, it may illustrate a desire to oppose this western facing broch, something to be explored further in Chapter Seven.

For other brochs in Orkney, there would seem to have been a degree of seasonality, in the sense that sites may have only been occupied for specific periods of the year. Indeed, many obviously sought the winter sunlight over the summer; something which seems well demonstrated in the dominant group of SE facing brochs (including: Loch of Ayre; Scockness; Broch of Lingro; Broch of Lingro; Bu; Howie of the Manse; and The Howe). Borwick's SE entrance maximises direct sunlight in the winter, but it loses noticeably more light throughout the rest of the year which a western entrance would have gained, therefore either suggesting a winter focus here, or a simple avoidance of the west. Dingy's Howe also has a SE entrance which gains more direct sunlight in winter in comparison to a W or SW entrance. However, the SE entrance loses direct light in the summer; light which a western entrance would have gained, again suggesting either a winter focus, or a western avoidance. Likewise, Manse of Harray faces SE, and although this orientation gains the maximum amount of direct sunlight in the winter, it too loses more light than a western entrance would have during the rest of the year; again suggestive of either an avoidance of the west, or of seasonality, focusing on the winter only.

Other brochs clearly counter this 'rule' however, and clearly favour summer/spring/autumn sunlight over winter. Midhowe for instance, facing due W, loses more light than a SE/SW entrance would have during the winter. Throughout the rest of the year however, its western entrance gains noticeably more light than an eastern entrance would have, thereby suggesting that it was the afternoon light of spring, autumn and summer which was desired overall. The fact that the entrance does not face southwards also suggests a seasonal focus which, unlike most brochs in Orkney, was orientated away from the winter optimum. Likewise, though Oxtro's western entrance was better than an eastern facing doorway would have been in the spring, autumn and summer, this orientation meant that the last hour of direct sunlight available during winter was lost; an hour which could have been gained had the entrance faced SE instead of due W. The western side of the ESE facing Howe of Hoxa would have also gained noticeably more direct sunlight during the winter, with its ESE entrance only gaining more light than the west during the summer months; thereby suggesting either a summer focus, or a simple avoidance of the west here, for whatever reason.

Like many brochs in Shetland, other orientations in Orkney may have been part of a strategy to avoid the wind. For example, though Ingshowe's SW entrance loses direct light throughout the year which an entrance towards the E/SE would have gained, it is located on an eastern facing coastline, and so its entrance may have been intended to simply avoid the winds coming off the sea here. Likewise, Riggin of Kami, located on another eastern facing shoreline, possesses a SSW entrance, facing away from the sea winds but losing slightly more light than a SE entrance would have as a result. Munkerhoose, located on the western facing coastline of Papa Westray, faces SE, and loses light which a SW entrance would have gained. But in doing so, it too faces away from the often strong winds coming of the sea here. But not all brochs followed this logic. The Broch of Burrian's SE entrance on North Ronaldsay is perfect with regards to direct sunlight, but its entrance faces directly into the sea, fully exposed to the ocean winds. Likewise, Midhowe's western entrance faces directly into the sea, suggesting a rejection of the east here. Therefore, although Orkney's orientation pattern seems straightforward at first, it is a complex picture of individual choice.

Conclusions: Good Light or Good Views?

The GIS approach taken in this chapter presents a somewhat complex picture with regards to orientation, with no simple pattern becoming apparent. What it does demonstrate however is that although it would seem that direct sunlight was generally sought (as we would expect for a doorway), the choice of orientation was clearly idiosyncratic across both Shetland and Orkney. For many brochs in Orkney (and Shetland to a lesser extent) however, there may have been a tradition of seasonality, in which any one site may have only been occupied – or partially occupied – for specific periods of the year. This would be unsurprising because, on the face of it, Orkney's orientation pattern (which is predominantly SE) suggests a wintery focus – understandable considering how little light is granted upon Orkney throughout the winter months. However, many of these brochs *only* favour the winter light (with a few others *only* favouring the summer/spring/autumn light instead). This suggests either (a) light for the rest of the year was sacrificed for good winter light (or sometimes summer light), (b) seasonal usage of these sites, or (c) that these orientations were cosmologically/symbolically influenced in some way. The latter is something which clearly differed across Scotland, and perhaps depended on individual sites and the practices conducted within or near them (e.g. metalworking, as to be explored in Chapter Seven).

General light availability (especially with regards to the winter, as seen in the focus on southerly orientations) seems to have been important within both regions, as noted, though this seems to be particularly true with regards to Orcadian brochs, with many choosing the orientation that gained literally minutes more direct sunlight than that granted from other cardinal directions (e.g. East Broch of Burray, Burrian Broch, Knowe of Redland, Loch of Ayre, Broch of Lingro, Howie of the Manse, and The Howe in Orkney; Brough Head on Shetland). This suggests that these broch builders were extremely familiar with the environment around the site, and were able to distinguish the subtlest changes in light in the landscape across the span of a year, orientating the domestic space accordingly. This would support the notion that Iron Age brochs were well adapted to their environments; countering the wind, maintaining warmth, and harvesting the best available light, as originally explored in Chapter Three.

But I would stress that the functionality of any orientation does not – and probably did not – preclude a cosmological or symbolic significance either. The existence of functionally illogical northern facing sites for example (e.g. Lamb Head, Howe of Langskaill, Old Scatness Broch, Loch of Snabrough, Hawk's Ness, and Loch of Brindister), suggests either a seasonal use throughout the summer, or it alludes to a symbolic/cosmological significance, perhaps with a focus on the summer solstice; forfeiting good direct sunlight for small amounts of ambient light throughout the year. Indeed, the idea of socially 'appropriate' orientations (that opposed a purely practical function), and which perhaps depended on factors such as class, status, or appropriate ancestry, may have some value. This is because other brochs, in both regions, clearly avoided certain cardinal directions, even though better light and greater protection from the wind could have been gained from such an orientation (e.g. Sae Breck, The Brough, Burland, Hoga Ness in Shetland; Gurness, Burrian Broch, Knowe of Redland in Orkney).

On this note, I return to the question asked previously as to why Shetland possesses many orientations towards the SW, which seems odd when compared to the predominantly E/SE orientation patterns of Caithness, Sutherland and Orkney; suggesting, perhaps, of a focus towards the sunset on the winter solstice in Shetland. Indeed, the difference between Shetland's orientation pattern and that of Northern Scotland was the reason why it was selected for this study on lightscapes. However, through the analysis above, we see that SW facing brochs on Shetland did generally seek the light available during the winter, while avoiding the wind; much like those in Orkney. Indeed, though the E or SE was the optimum with regards to light, it is likely that some of Shetland's brochs (e.g. Burraland, Loch of Houlland, Clevigarth) were required to face SW due to the fact that they were positioned on eastern facing shorelines, thereby avoiding the often strong winds coming off the sea.

This raises a potentially significant point: if there were orientations thought to be 'appropriate' (which in Orkney, was generally eastwards), the locating of the broch near the sea took precedence over this need to orientate the entrance towards the east. This can be determined in Shetland, at Mousa, for example. Facing due W, Mousa clearly avoids the east; probably because an eastern entrance would have lost light in this location throughout the year, as noted in its case study above. However, this position gives Mousa broch a commanding view over Mousa Sound, thereby suggesting location was more important than what may have been considered to be an 'appropriate' orientation. Indeed, it suggests broch orientation in Shetland was altered according to location (as opposed to location being altered according to what may have been an 'appropriate' orientation), even if this meant that certain brochs had to face SW as a result of this (such as at Inshowe and Riggin of Kami on Orkney; though the Broch of Burrian on North Ronaldsay is an exception to this rule). This may have been particularly common on Shetland. For example, an association with the sea can clearly be seen at West Burra Firth, an island broch located within a natural harbour. The broch itself gains barely any light throughout the winter (even though there are much better illuminated locations on the land overlooking the harbour), thereby indicating that a good relationship with the sea took precedence over good light in winter.

Indeed, as one can discern when examining the viewsheds and photographs (as noted within the case studies above), for both Shetland and Orkney, an excellent view out to sea was generally a significant factor when positioning the broch. For many Orcadian brochs, such as Lamb Head, Borwick, Howe of Hoxa, Loch of Ayre, Hillock of Burroughston, and the East Broch of Burray, among others, sweeping views of the sea were clearly desired. Many of these were obviously intended to be highly visible from the sea too as they were commonly located on cliff tops or on high ground such as Hoxe of Hoxa and Borwick. Others overlook narrow sea corridors, such as Midhowe and Gurness on Eynhallow Sound, and The Howe at the narrow entrance to the Loch of Stenness. The desire to overlook the sea is just as clear in the Shetland examples too, which include: Hawks Ness, Levenwick, Fugla Ness, Burraland, Mousa, Sae Breck, The Brough, St Rognvald's, South Voe, Clevigarth, Brough Head, Burland, Hoga Ness, and West Burra Firth.

From the case studies above, it is also notable that few brochs, in both regions, possessed views of other brochs, and that instead, like the Neolithic tombs on Orkney (Phillips 2003), they were intended to be seen from the sea, and possessed good views of the sea, suggestive of a very strong maritime culture in these regions. Most importantly however, as suggested in the examples above, although landscapes of good light were generally sought so as to orientate the home accordingly, this was not at the expense of good views of the sea.

What this all suggests is that rather than the broch entrance being solely cosmologically inspired towards the rising sun in the east (as explored in relation to sunwise movement around the 'home' in Chapter Four), orientation was generally an idiosyncratic choice that seems to have largely depended on the location of the broch itself, at least in Orkney and Shetland (though cosmological factors may have still been influential of course; for instance, in the initial choice of site, such as we see at Howe). The position of the broch in the landscape was thus a very important factor, and if I am to explore the nature of Iron Age communities in the Northern Isles, I need to compare their affinity for the sea (and as such, water in general) with other regions in Scotland so as to determine how strong this maritime influence was here. This, in turn, will allow us to comprehend the nature of the relationship between water and light in the Orkney Islands, which forms a case study in Chapter Seven.

Chapter Six

Water and the House: The Aquatic Iron Age of Atlantic Scotland

Introduction: Landscapes of Water, Landscapes of Light

Thus far, this thesis has examined the significance of light; especially it's practical and cosmological attributes. But what of another element – water?

As noted in the Introduction, light and water clearly differ from one another, and as the title of this thesis emphasises light above all other elements, any shift towards examining the nature of water requires some justification. I thus wish to begin this chapter by arguing that, although at first, water and light may seem to be two very different elements, they actually share a very close, interconnected relationship with one another; something which is seen, perhaps most obviously, in water's luminescent nature and its capacity to reflect light.

Indeed, water shimmers with movement and, like fire (its light-bearing counter-part), it is often noted for its mesmerising and hypnotic qualities (see: Dennis 2008: 96; Haslam 1991: 281; Schiffman 1996: 179-180; 199; Watt 1991: 42; Winkleman 1986: 101). This characteristic is due to the fact that light is scattered off water's surface, thereby allowing water to act as a constantly shifting light source, and it is this quality (i.e. its shimmering irregularity) which makes it so visually compelling (Strang 2004: 52). But this also means that water's relationship with light is one in a perpetual state of flux, with different lighting conditions consistently changing our perception of this element; a feature often remarked upon by anthropologists. Malinowski (1984 [1922]: 220), for example, working in New Guinea, noted how: 'the sea will change its colour once more, become pure blue, and beneath its transparent waters, a marvellous world of multi-coloured coral, fish and seaweed will unfold itself'. Another anthropologist, Firth (1983 [1936]: 29), working in Polynesia, likewise noted that: 'in the evening the shades of the sea vary from a steely grey, where the light is reflected on it, through a pale green of the reef waters inshore, to a darker green near the reef edge, and an indigo beyond'.

Such examples demonstrate how water, and especially 'waterscapes', fluctuate in the moment, radically altering the nature of the landscape (and our perception) as they change; very much like the changing lightscapes of Chapter Five. Indeed, though shifting lightscapes clearly transform our perception of the land (depending on the time of day, and the angle of perception), natural water bodies – being highly reflective, and thereby serving as a strange kind of mirror of the sky over them – are arguably the most influenced aspect of the landscape with regards to light; with their colour, luminosity, and reflectivity changing in accordance with light. As such, the relationship between light and water is an incredibly transformative and powerful one, and because of this, water deserves significant attention within any study on light.

As suggested in Chapter Five, both water and light seem to have been especially important with regards to the locating of brochs in Orkney and Shetland. Indeed, *direct* sunlight seems to have generally been sought within the broch, with many brochs in Orkney and Shetland being focussed on gaining the maximum amount of direct sunlight throughout the winter (and with many others interestingly *only* gaining direct winter sunlight). However, Chapter Five's approach to landscape also makes it apparent that the broch was often positioned overlooking the sea; suggesting a strong engagement with both water and good light in the Northern Isles.

One could assume that this was largely a practical matter, reflecting the need for a northern island community to be positioned near the sea, and the fertile land which is often found on the coast, while also retaining the maximum amount of direct sunlight during the period of the year when light was least available. However, as shall become apparent within Chapter Seven (consisting of a case study focused solely on Orkney), such a strong engagement with water and light would have fostered meaningful and symbolic attachments too, and indeed, it is very probable that both these elements were granted great significance in Iron Age societies across Atlantic Scotland, influencing the positioning and structure of the Iron Age dwelling while also shaping perceptions of the landscape itself.

Such a powerful influence on any culture is understandable because, like light, water is one of the most omnipresent and indispensable elements of the human world, and for this reason it is a substance that all societies necessarily pay very close attention to within their environments. Whether it is a concern regarding the production of good agricultural harvests, the availability of fish and other marine resources, the watering of cattle, the requirement of rain, or the prevention of floods, every human society is and has been fully aware that their survival depends upon the right amount of water at the appropriate time. As Strang (2005: 101) argues, water is thus inescapably not only a substance of individual physical survival, but it is also the substance of all production and reproduction – water is literally an essential matter of life and death for all humanity.

However, along with the obvious practicality of water, it is also an extremely diverse element; as suggested in its relationship to light. An element that is also endlessly transmutable, moving readily from one shape to another: from ice to stream, from vapour to rain, from fluid to steam, water is at the same time constant in every context: it will freeze, thaw and evaporate at the same temperature, precipitate under similar conditions, describe predictable patterns of flow in response to topographic forms, and retain consistent visual and audible characteristics in all its various forms. Further, it exists in various scales: from a trickle to a flood, from a droplet to an ocean. And so, it is no wonder that water's fundamental and changeable nature has allowed it to be consistently encoded with powerful symbolic themes of meaning, and these resurface in different forms in every cultural context, exerting a major influence on the contests for the ownership and control of water resources.

Like light then, water is a *necessary* element of varying degrees, and we can be certain that Iron Age societies regarded light and water as essential to their needs, just as we do today. It is to our benefit then that archaeologists are increasingly exploring the position which water may have held in the past (for various examples, see: Addey 2008: 32; Bradley 2000; Brown 2004; Coles 2001; Coles, Coles and Jorgensen 1999; Cooney 2003; Cummings and Fowler 2003; Darvill 2004; Fitzpatrick 1984; Frieman 2008; Henderson 2009; O'Sullivan 2009; Phillips 2003; Rainbird 2007; Reinhard 1988; Richards 1996; Rogers 2007; 2011; Van de Noort 2004; Warner 1994; Watson 2004; Worsaae 1842; Willis 2007). However, such research clearly demonstrates a difficult and perplexing point: that although water may be a universal necessity, the meanings which are then attached to it make it an extremely culturally specific element to study (much like the study of light). Water thus becomes especially multifaceted in a socio-cultural environment, and so tackling the meanings attributed to it requires a thoughtful approach, especially when one is attempting to gauge how it was experienced within a prehistoric culture which was, or at least seems to have been, far detached from one's own. Indeed, the ways in which water may have been experienced within Iron Age society is largely hidden from us in the present, and its significance is only marginally hinted at in the archaeological record.

It is still well attested, however, that Iron Age societies across Europe attributed some sort of significance to water, with its religiosity being remarked upon in the classical texts (Mela 1998: III.48; Strabo 1917-1932: IV.4.6; cf. Braund 1996: 12-21; Buxton 1994: 102-103; Derks 1998; Green 1986: 166; Webster 1995: 449-451). And it is widely accepted that prehistoric communities often gave natural places and the elemental forces within them, such as water, symbolic and ritualistic significance (Bradley 2000: 27; Braund 1996: 12-21; Hedeager 1992; Rogers 2011: 647; Willis 1997; 2007). Such consideration is demonstrated in the positioning of Iron Age shrines near the sea (Elms Farm, Heybridge; Hayling Island; Lancing Down, West Sussex; and Worth in Kent; Willis 2007: 120), bog-body 'sacrifices' (Briggs 1995; Coles, Coles and Jorgensen 1999; Giles 2009; Glob 1969), the disposal of the dead in watery, especially riverine, contexts (Evans 2013; also see: Bradley and Gordon 1988; Chamberlain 2003; Marsh and West 1981), and the common use of riverine islands (Brown 2004; cf. Evans 2003; Evans, Knight and Webley 2007; Webster 1995). Water's 'sacredness' can further be seen in the ritually charged behaviour of depositing metalwork and 'votive' artefacts in watery contexts throughout the Late Bronze Age and Iron Age (see Bradley 1990b; Coles 1990; Fitzpatrick 1984; 2005: 161; Warner 1991; cf. May 1992: 97), with specific examples including the many metal deposits found at Fiskerton (Field and Parker Pearson 2002). Such practices seem to have occurred in Scotland too, with examples including: the Ballachulish figurine, found in an Argyll bog (Christison 1881); the cauldrons discovered within the bogs at Blackburn Mill and Carlingwark (Green 1986: 146); and the boar's head terminal of a '*carnyx'*, found within a watery deposit at Deskford, Moray (Aldhouse Green 2004: 95). But these examples merely hint at the complex and often tangled meanings which are given to water, and suggest its importance to be somewhat peripheral to these communities.

However, as was briefly, and marginally, explored in the previous chapter, water bodies (especially the sea) seem to have been very significant to Iron Age communities in the Northern Isles. This is clearly demonstrated by the fact that although light is a universal requirement (especially in relation to the domestic space), landscapes of good light in Shetland and Orkney were often sacrificed in lieu of areas which held excellent views of water bodies. This suggests that water was of great significance here, and may have been rather central to the identity of these communities.

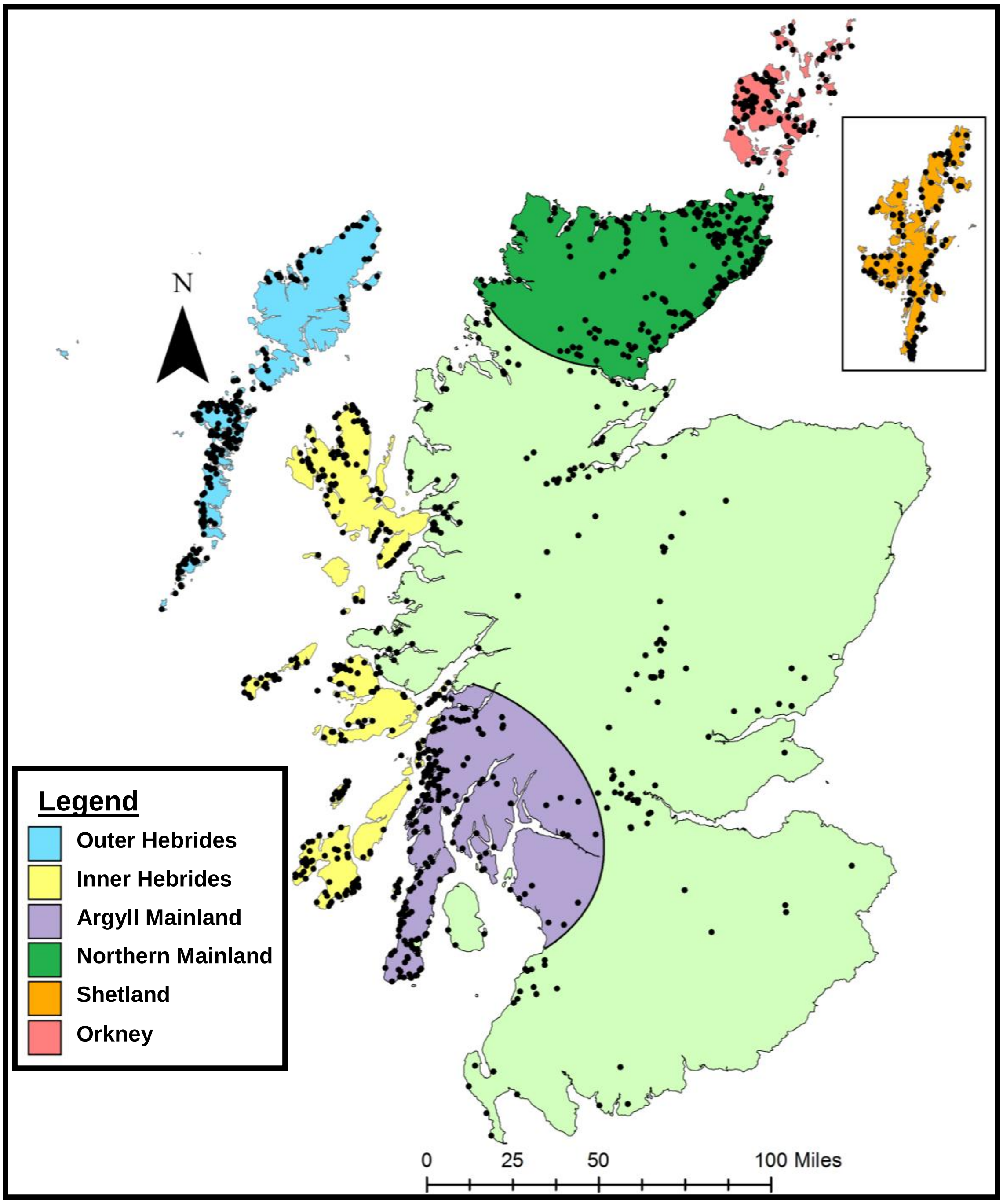
As is to be explored below, this strong connection to water may have even extended to other areas of Scotland; something which has also been suggested in Rennell's (2008; 2010) work on waterscapes, visibility and 'islandness' in the Outer Hebridean Iron Age. Indeed, throughout Atlantic Scotland, the settlement record is particularly dominating (as noted in previous chapters), and as shall become clear, sites here were often incorporated into (or at least overlooked) aquatic contexts, much like those brochs in Shetland and Orkney, further highlighting the significance attributed to water within these locales. As noted at the beginning, these waterscapes would have also reflected light, and would have doubtless helped illuminate the landscapes around certain sites; another feature which deserves exploration. On that note, the aim of this chapter is to examine the proximity which Atlantic Scottish Iron Age communities had with the water within their landscapes and to gauge the strength of this relationship. Only then will I be able to comprehend the significance which may have been attached to this element, and how it may have affected society at large. This is important for the purposes of this thesis because, if water was central to the identity of Atlantic Scotland's Iron Age communities, then the role of light - and the meanings given to it - are likely to have intertwined with the role and meanings given to water (as the two elements are very much connected, as noted earlier), thereby demanding that we examine this element in depth here.

The Methodology

This study will focus on the regions of Atlantic Scotland (see Figure 6.1), which include: (1) Shetland, (2) Orkney, (3) Caithness, (4) Sutherland, (5) the Western Isles and Skye, and (6) Argyll. As this analysis looks at multiple areas, it is important to broaden the scope and examine the range of settlement forms which exist across these regions. However, as this thesis has thus far examined the drystone roundhouses known as 'brochs', I will only examine the Iron Age drystone roundhouses noted by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS); i.e. those termed to be 'brochs', 'duns' and 'wheelhouses'; as defined in Chapter Two.

To briefly describe each of these as noted by RCAHMS, 'brochs' are those traditionally defined as a complex architectural form using hollow-wall techniques, in combination with intra-mural galleries and cells, to create a stable dry-stone tower (MacKie 1965a; cf. Armit 1990b: 436; 1997; MacKie 2002a;

Figure 6.1. Regions of Atlantic Scotland to be analysed. Black dots refer to Atlantic Roundhouses. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



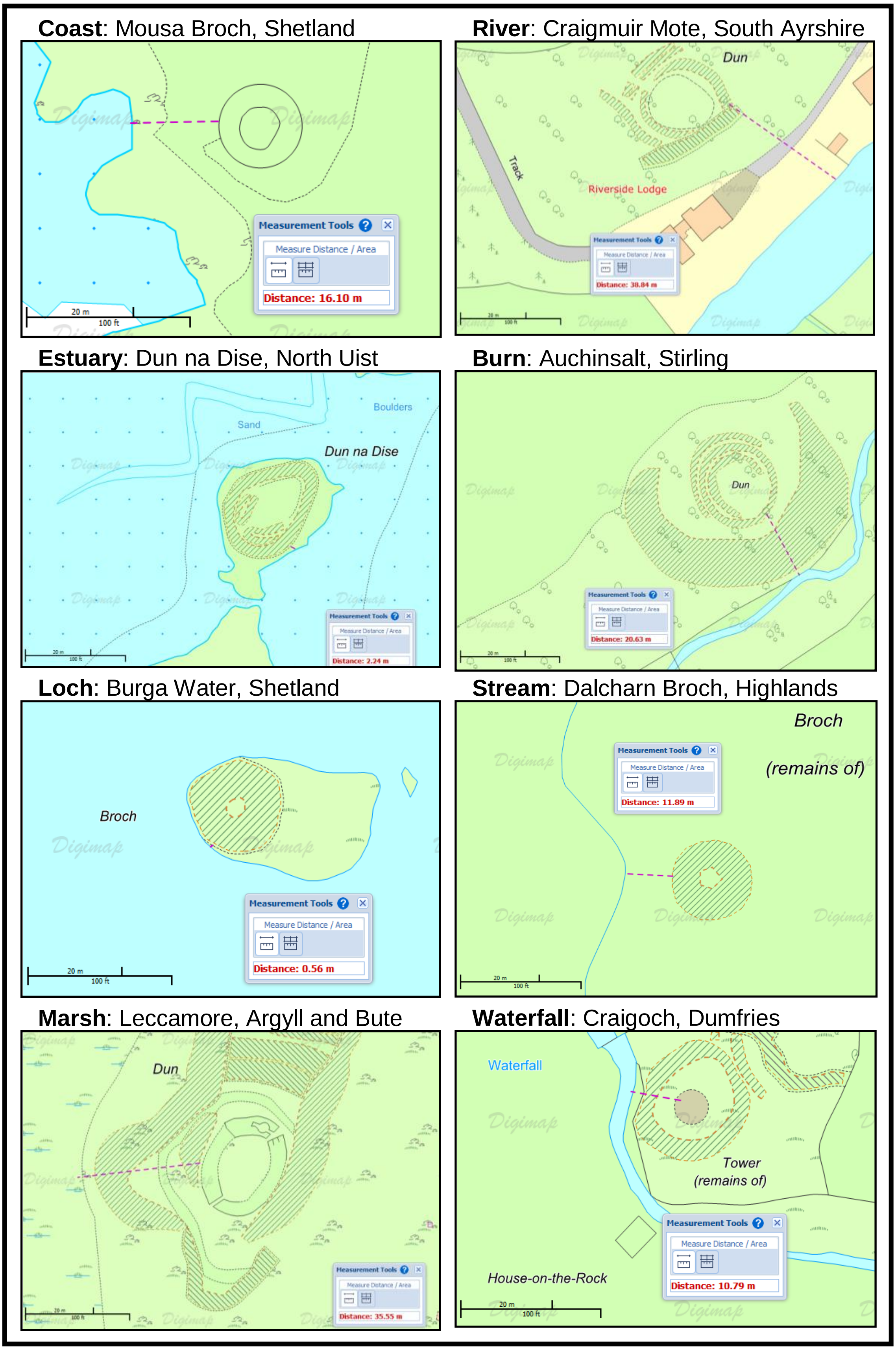
Parker Pearson and Sharples 1997). Wheelhouses, representing another form of domestic architecture (Armit 1988; Sharples 1998: 208), were often revetted into sand-hills (Beveridge and Callander 1931) and though many would have appeared unimposing to those outside, once inside, they would have been towering and monumental.

The hundreds of drystone sites in Argyll, the Inner and Western Isles and elsewhere that do not possess the full range of architectural devices required to qualify as brochs or wheelhouses, tend to be classed under the catchall term, ‘dun’, essentially representing a ‘simple’ drystone walled enclosure without the architectural complexity of the broch or wheelhouse, and generally thought to date to the early first millennium AD (Alcock and Alcock 1987; Nieke 1984, 1990).

These are all alike enough in their architectural and cultural details however to allow talk of shared cultural traditions across Atlantic Scotland, from the Shetland Islands to Argyll; and together, these strongly built drystone units are collectively referred to as ‘Atlantic Roundhouses’ (Armit 1990b; 1992) (though again subdivided into ‘Simple’ and ‘Complex’ categories), as noted in Chapter Two. For the purposes of this analysis, and to avoid confusion, I shall use the term ‘Atlantic Roundhouse’ (henceforth abbreviated to ‘AR’) as a shorthand for the whole heterogeneous class of drystone roundhouse monuments, although in places I shall still use the terms ‘broch’, ‘dun’ and ‘wheelhouses’ in order to maintain a sense of regional disparity when appropriate. It is also of note that as I am only exploring the relationship between water and ARs, I shall not be examining those sites which the Royal Commission term ‘forts’, ‘souterrains’ ‘hillforts’ or ‘crannogs’, which lie outside the definition of ‘Atlantic Roundhouse’.

Regarding the maps used to measure the distance between ARs and their nearest water body, I used ‘Digimap Roam’, which enables one to view maps using Ordnance Survey data at one of 14 different pre-defined scales. These consist of different Ordnance Survey map products which are appropriate for each view's scale, and include: (1) GB, 1:7,500,000; (2) National, 1:1,500,000; (3) Regional, 1:750,000; (4) County, 1:375,000; (5) Metropolitan, 1:189,000; (6) City, 1:95,500; (7) District, 1:47,000; (8) Local Plus, 1:38,000; (9) Local, 1:19,000; (10) Neighbourhood, 1:9,500; (11) Street, 1:4,700; (12) Detailed, 1:2,500; (13) Plan, 1:1,250; and (14) Building, 1:500. In conjunction with these maps, I used measurement tools available within Digimap Roam – which allows distance to be measured on these maps – to measure the distance between all the known ARs (1,276 sites) and their nearest water source (for examples of how this was achieved, see Figure 6.2).

Figure 6.2. Examples of Measuring the AR Proximity to Various Water Bodies using Digimap. All measured at 20 metres.



It should be noted here that this study focuses specifically with surface water (in contrast to ground or atmospheric water) as illustrated on Digimap Roam's OS maps, which include: the sea (with measurements taken from the ‘High Spring Tide’ mark), lochs, estuaries, waterfalls, natural springs and ponds (at least those noted on the OS maps), and marshes/wetlands. There is also a variety of courses where water constantly flows in one direction - i.e. rivers, burns and streams. Rivers are those which are noted on the OS maps to be such (e.g. ‘River Wick’), and are usually the largest of the three. Burns also tend to be noted by name (e.g. ‘Burn of Langskaill’) and vary in size from what could be interpreted as large streams to small rivers. Streams (which also include brooks) are generally considered to be smaller than most burns and rivers, and usually lack names on OS maps. Proximity to artificial, manmade water sources (field drainage/irrigation systems, reservoirs, dams) are omitted from this study.

All in all, the analysis within this chapter is largely dependent on the data from these maps, and one can safely assume that some features (such as undiscovered localised springs) are not illustrated. Obviously, personal site inspection would have been of benefit to this study, thereby allowing me to judge AR proximity first-hand. But the scope of this chapter - which looks at over a thousand ARs across Atlantic Scotland - is too large. I have however visited ARs in Shetland and Orkney to the benefit of the analysis of these two regions at least. And with this in mind, it is important to note the other shortcomings of this analysis, which are largely unavoidable.

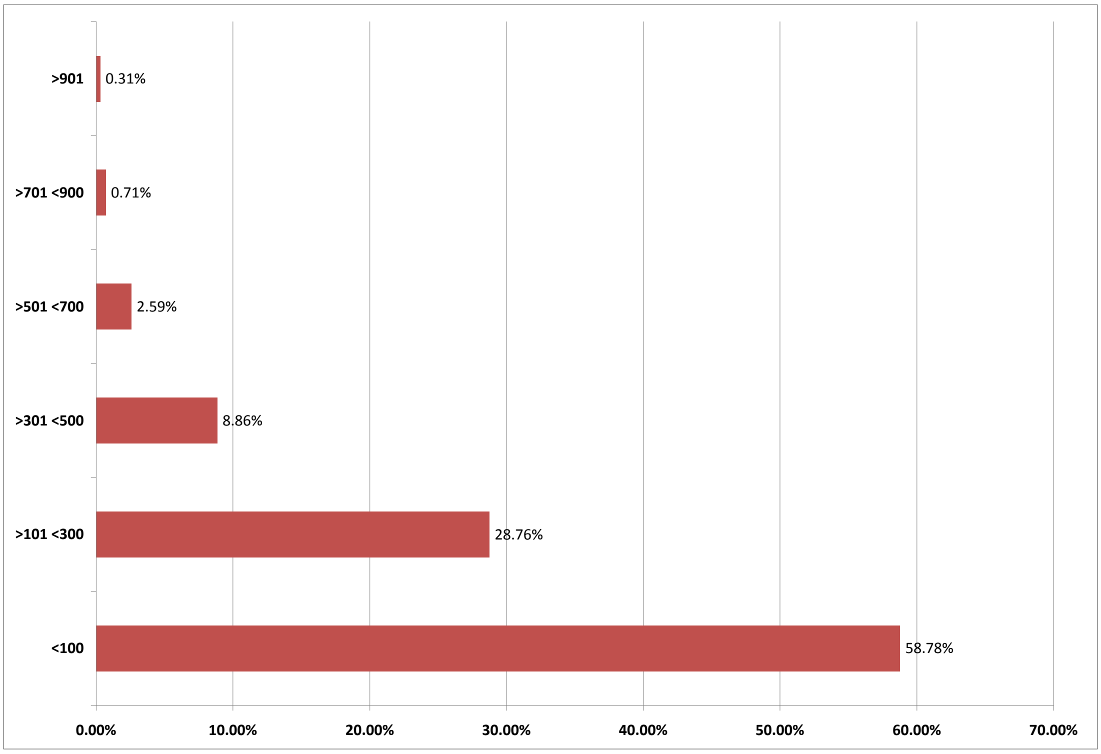
The primary issue is that some water bodies may have changed somewhat since the Iron Age. For example, for many ARs, coastal erosion is a problem, and indeed, many are currently in danger of eroding into the sea (the broch of Breckness in Orkney being a prime example; Ballin-Smith 2002; Ballin-Smith and Ballin 1993; Laing 1867: 63; Lynn and Campbell 1995: 104; Smith and Lorimer 1987: 33-34; cf. Carter, McCullagh and MacSween 1995), and many others have already been lost to it (for issues relating to coastal erosion, see: Ashmore 1994; Dawson 2003; 2006; 2010). Therefore, sections of shoreline in many areas of Atlantic Scotland (especially the Western Isles, Skye, and Orkney) may have simply eroded (or retreated) and ARs once inland are now closer to the shore; though for many currently eroding ARs (e.g. Jarlshof in Shetland; Midhowe in Orkney), it is clear that they were nonetheless positioned with the coast in mind.

In other areas, marshland may have extended or retreated, or streams and burns may have been diverted or blocked since the Iron Age; and ARs once further away from water sources are now potentially located nearer to them, and vice versa. Though these issues need to be considered when reflecting on this analysis, they are also unavoidable. This is acceptable here because the aim of this chapter is to create a *general* picture of the relationship of ARs to water throughout the various regions of Atlantic Scotland, and for the most part, this is achievable, as shall become apparent.

The General Proximity of ARs to Water Bodies

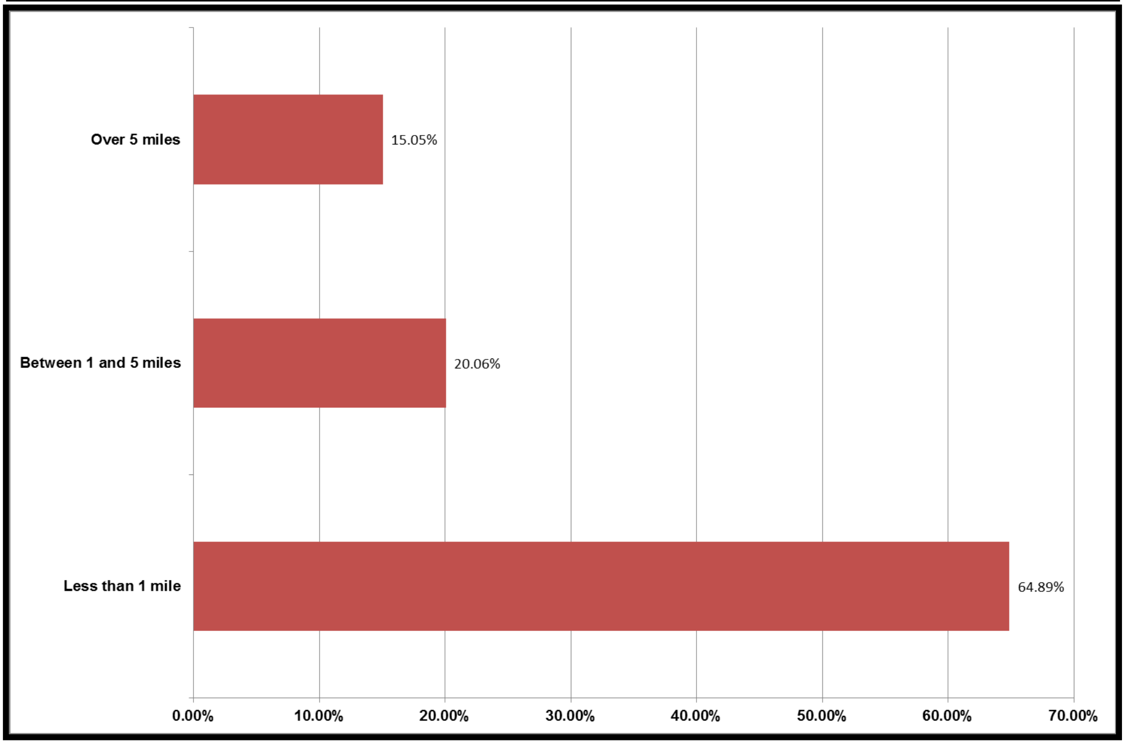
From these measurements, we can discern that 28.68% (366 ARs) are found within only 25 metres of any single water body; 13.79% (176) lie between 26m and 50m; 16.30% (208) are between 51m and 100m; 28.76% (367) are between 101 and 300m (367); and 8.86% (113) lie between 301 and 500m, with the remaining 3.61% (46) positioned outside this range. This means that a large proportion of ARs – 58.78% (750) – are within 100m of a naturally occurring water body (Figure 6.3); with the majority of 87.54% (1117) within 300m, which would have constituted a short walk for many (depending on topography of course).

Figure 6.3. Distance to Nearest Water Body for all ARs.



For many ARs, the coast was the most dominant aspect of the landscape, and with regards to coastal proximity of the all the ARs together, the measurement between all the known sites (1,276) and the mean high water springs of the current coast line have also been recorded. From these measurements taken across all the regions of Scotland, 64.89% (828) of all ARs are located within a one mile radius of the modern coastline. Another 20.06% (256) are found within one and five miles from the sea, with the remaining 15.05% (192) being located beyond five miles, constituting inland ARs (Figure 6.4).

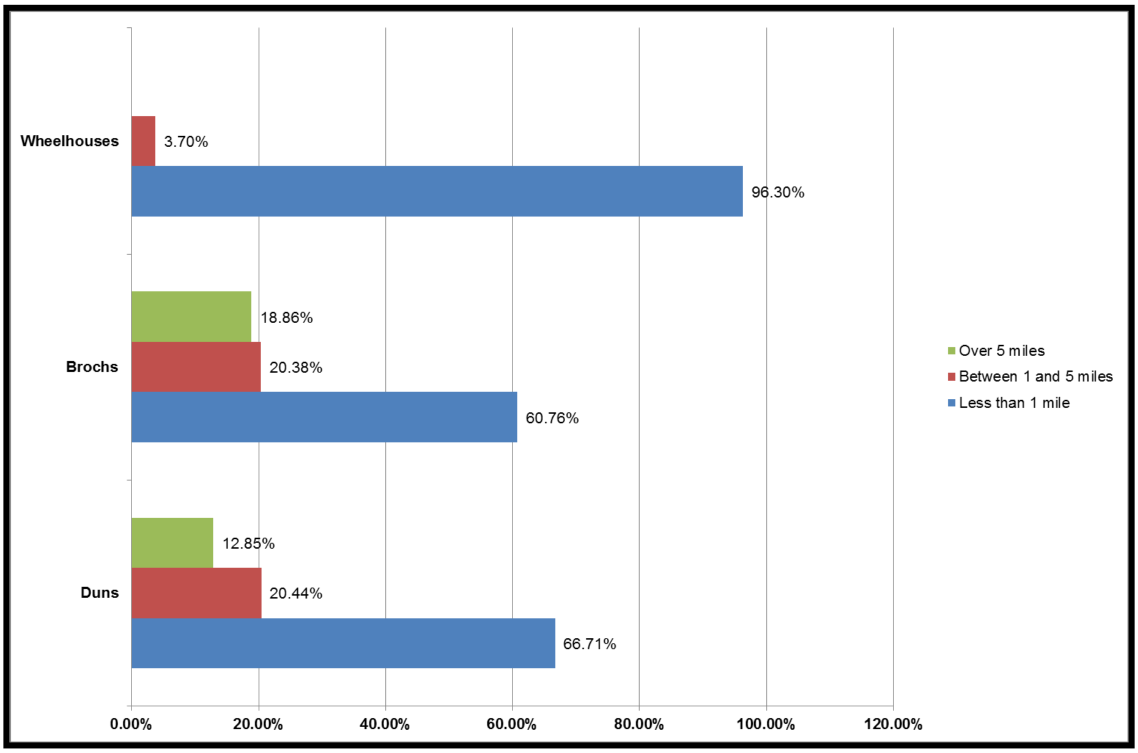
Figure 6.4. Distance to the Coast for all ARs



Therefore, the positioning of the domestic space in close relation to the coast is generally a common feature of Atlantic Scottish Iron Age society. In fact, out of the entire dataset, 28.21% (360) are actually located within the first 100m of the shoreline; 40.75% (520) are within 350m and 45.45% (580) are within 500m. This means that out of all the ARs located within a mile of the coast, 43.48% of these alone are located within the first 100m of that mile.

For the sake of regionalism, if we split ARs into the three types of sites noted above, i.e. ‘duns’, ‘brochs’ and ‘wheelhouses’, as seen in Figure 6.5, we see a slight discrepancy between the brochs and the duns. Out of the 724 duns, 483 (66.71%) are found within the first mile of the coast, compared to the 319 (60.76%) out of a total of 525 brochs. This is a difference of 5.95% only. Another 20.44% of duns (148 sites) and 20.38% (107 sites) of brochs are located within one and five miles, while the remaining 12.85% (93 sites) of duns and 18.86% (99) of brochs lie outside this range. Though it may seem that the

Figure 6.5. Distance to the Coast for all Duns, Brochs and Wheelhouses.



duns were intended to be located nearer to the coast than the brochs, if we consider sites within the first 100m alone, we find a higher proportion of the entire broch dataset found within it at 31.62% (166); compared to the duns 25.14% (182). Out of the twenty-seven wheelhouses noted in the dataset, twenty-six (96.30%) are within one mile of the modern shoreline, much higher than the brochs and duns. This is probably because of the coastal nature of wheelhouse architecture, with sand usually being needed in their construction. Indeed, the coast was the dominant aspect of wheelhouse positioning, with 44.44% (12) within 100m, and 88.89% (24) within 500m of the shoreline. However, though the coast is the nearest body of water for 38.64% (493) of all ARs together, it is important to consider proximity to all the different types of watery contexts.

As seen in Figure 6.6, other notable water bodies include lochs, with lochs being the closest water body for 17.95% (229) of the dataset; streams, at 17.01% (217); burns, which constitute the larger streams, at 12.93% (165); and rivers, at 8.93% (114). Other features include natural ponds, at 1.33% (17); waterfalls, at 0.78% (10); marshes, at 0.63% (8); springs, at 0.71% (9), and estuaries, 0.55% (7); with another 0.55% (7) being uncertain due to the amount of modern drainage surrounding certain ARs (especially in Caithness and Sutherland). For the Atlantic Scottish Iron Age communities in general then, the

Figure 6.6. Nearest Water Body for all ARs

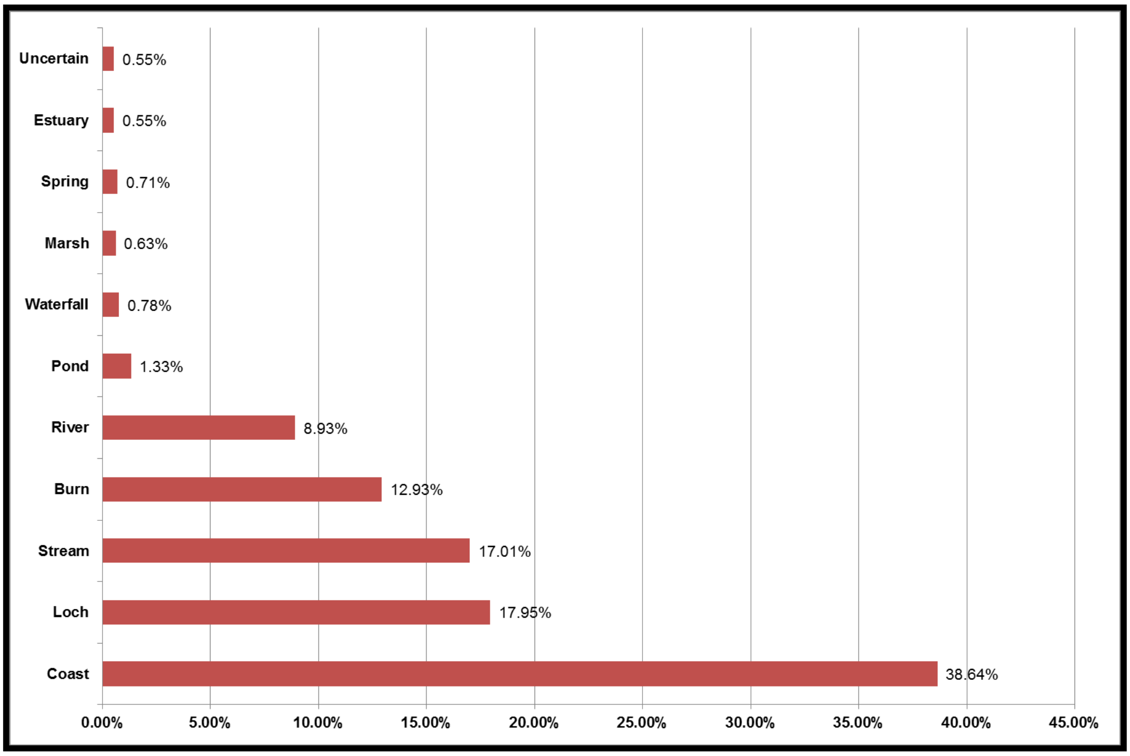
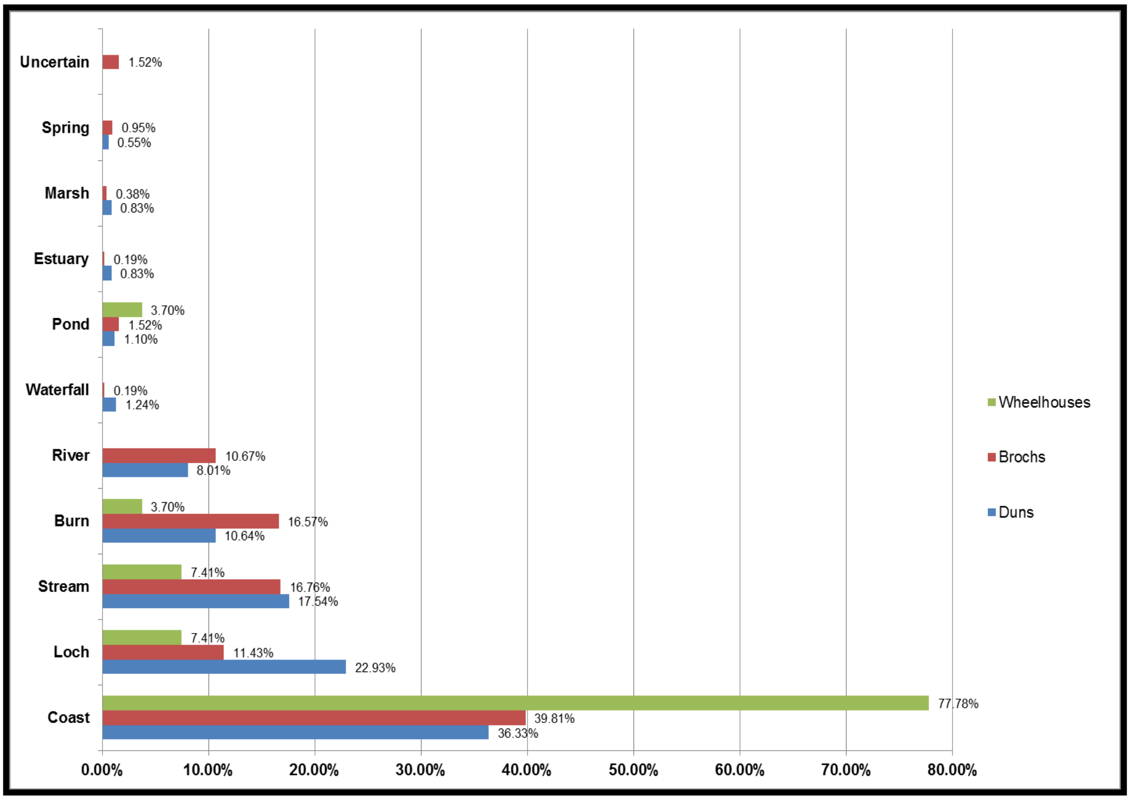


Figure 6.7. Nearest Water Body according to Type of Site



coast tended to be a dominant aspect of the landscape when considering AR location. However, as noted in the above analysis and in Figure 6.6, the coast, though usually nearby, was not always the nearest water body, and so it is important to consider proximity to all types of watery contexts depending on the type of site.

Beginning with those duns, brochs and wheelhouses whose nearest water body was the coast, the following analysis examines the proximity of each type of site to its nearest water body – e.g. coast, loch, river, stream, burn, etc – and this is laid out in Figure 6.7.

Coastal

For many duns, the coast is the most prevalent water body in the landscape, as it is the nearest water body for 36.33% (263) of the entire dun dataset. Out of this 'coastal' dataset, many are positioned within only 25m of the shoreline, at 22.43% (59); 42.59% (112) are within 50m; the majority, 67.68% (178), are within 100m; 92.40% (243) are within 350m; and nearly all, 96.96% (255) are within 500m.

For the brochs, the coast is also the most dominant water body, being the nearest source for 39.81% (209) of the broch dataset. However, out of these, coastal brochs are positioned even closer to the shore than the duns. A high proportion – 43.54% (91) – of coastal brochs are located within 25m of the shoreline, a difference of 21.11% from the duns. 64.11% (134) are within 50m; 76.08% (159) within 100m; 96.17% (201) within 350m; and nearly all, at 98.56% (206) are within 500m. This suggests that although many coastal duns may have been located near the coast to be seen and to observe others, the brochs were located closer, suggestive of a need for seaward dominance.

The wheelhouses are wholly different however. Out of the twenty-seven wheelhouses noted, twenty-six (96.30%) are within one mile of the modern shoreline. It is unsurprising then that the coast was the nearest water body for 77.78% (21) of this dataset, much larger than both the duns and brochs. This is obviously due to the coastal nature of these sites, which are often excavated into sand dunes or sandy machair, more often than not very near the sea.

Lochs

Considering other contexts, the nearest water body for 22.93% (166) of all the duns are lochs, many of which have island duns within them such as we see in the Outer Hebrides, and as will be explored in the regional analysis below. Very close proximity to lochs was usually essential for such sites, with 68.67% (144) of these being located within 25m of the water's edge – a large proportion; 76.51% (127) are within 100m, and 95.18% (163) lie within 350m. The brochs are fairly similar, though possess a much lower percentage, with only 11.43% (60) actually having a loch as its nearest water body. Out of these however, 62.30% (38) are located within 25m, but a slightly higher proportion than the duns, at 77.05% (47), lie within 100m; with 91.80% (56) being located within 500m of the water's edge.

Burns and Streams

The nearest water body for 28.18% (204) of all the duns are burns and streams. The close proximity of sites near lochs, in which 144 duns are located within 25m of the loch's edge, is not shared here however, as only 4.90% (10) are within 25m of a stream or burn; perhaps as a way of protecting the house from potential flooding. However, easy walking distance seems to have been a requirement as 89.59% (182) are within 350m, and 95.59% (195) are within 500m. Indeed, no dun for which a stream or burn is the nearest water body is further than 790m from such a feature. Therefore, none of these sites are further than a ten or fifteen minute walk from their nearest stream or burn.

Considering the brochs, 33.33% (175) are found nearest to streams and burns, though a slight distance is usually maintained (as expected due to potential flooding), with only 14.29% (25) of these found within 25m. Many are found within 100m however, with 45.71% (80) of this set within this distance, and the majority are within easy walking distance, with 89.22% (192) within 350m, and 95.59% (195) within 500m of these features.

Rivers

The nearest water body for 8.01% (58) of duns are rivers. Much like burns and streams, but unlike coastal sites, close proximity is rare, with only 5.17% (3) of this dataset within 25m of the riverbank itself; probably because of the risk of flooding. 32.76% (19) are within 100m, and the majority are within 350m of the water's edge, at 82.76% (48). However, all but one is within 500m of a river, constituting 98.28% (57); indeed, the one outside this range is only 555m away from its nearest river. Therefore, when rivers were the nearest water source to a dun, a moderate, but still close distance was usually maintained, probably due to the fact that good agricultural land is often located on the floodplains of many rivers.

For brochs, rivers were the nearest water source for only 10.67% (56). Many of these riverside brochs are found in Caithness and Sutherland, as explored in the regional analysis below. Unlike the duns, brochs tended to be positioned quite close to the rivers which they were positioned near to. Indeed, 16.07% (9) are found within 25m of the waters edge (three times as many as the duns), and 55.36% (31) lie within 100m, which is difference of 22.6% with the duns. 89.29% (50) lie within 350m, and all of this set is within 500m. Therefore, though it is quite rare for a broch to be positioned near a river – probably due to the high proportion of the broch dataset being located on islands which do not possess such water courses – when they were, they tended to be found in close proximity to them.

For further investigation, it is required that we section up this analysis according to the different regions of Scotland, as some areas of Scotland are more prone to coastal/loch/river proximity than others. What follows (and returning now to the terminology of AR) is a regional analysis of AR proximity to water bodies in the following areas: (1) The Outer Hebrides (for a similar study of this area, see: Rennell 2010), (2) the Inner Hebrides, (3) Mainland Argyll and Bute, (4) the Northern Mainland of Sutherland and Caithness, and (5) the Northern Isles of Orkney and Shetland (refer to Figure 6.1).

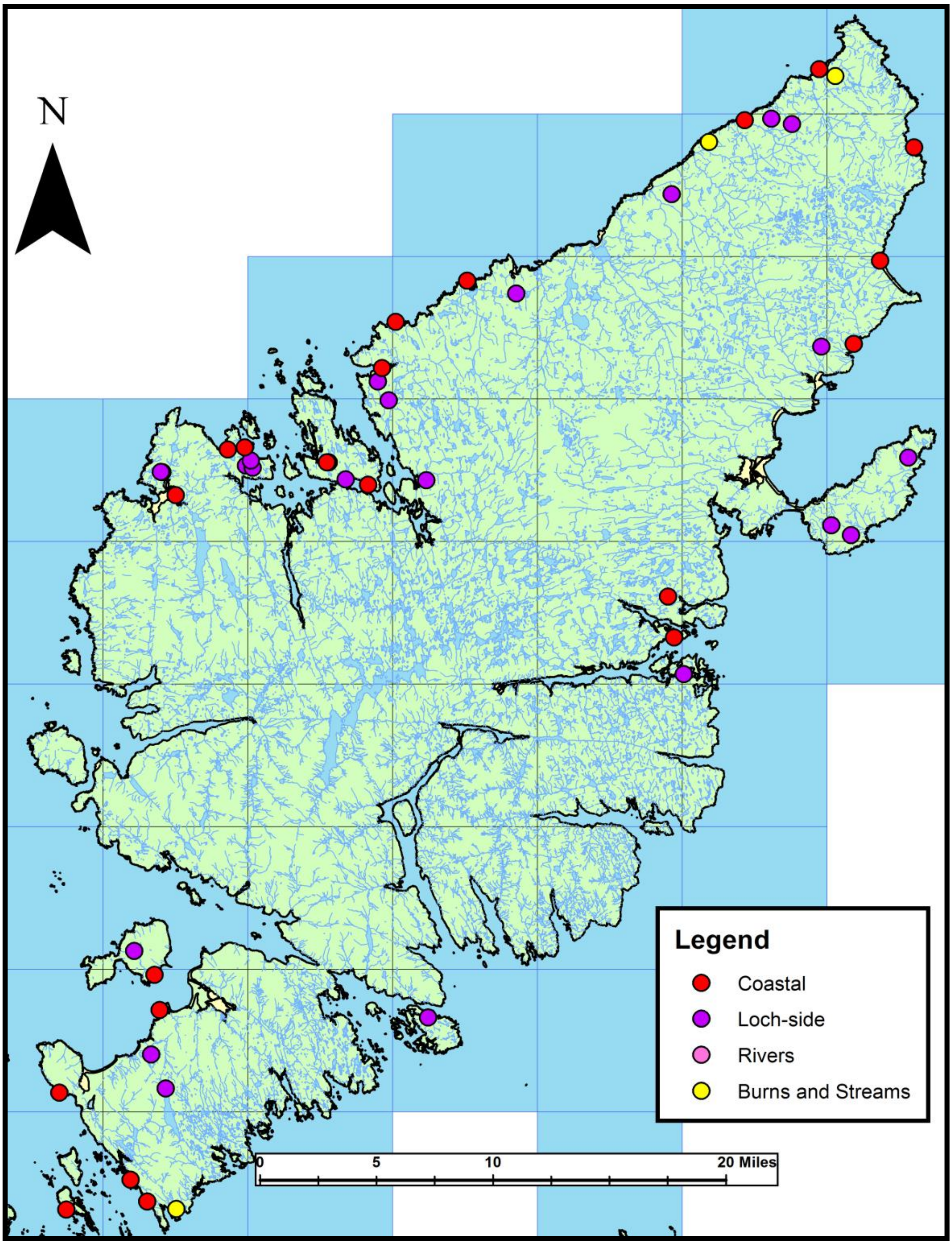
The Western Isles

The Outer Hebrides and Skye possess 302 ARs altogether. As we would expect for an island group, a large proportion of ARs (243) are within a mile of the coast, making up 80.46% of the dataset, while the remaining 59 ARs (19.54%) lie between one mile and five, meaning that there are no ‘inland’ ARs outside this range. Yet, although a high proportion of ARs are within a mile of the shore, only 25.83% (78) are actually located within 100m of the coast. As we shall see below, this is lower than the northern island group, and if we explore this set by individual islands, there are obvious and clear distinctions between them.

Lewis and Harris

Lewis and Harris (Figure 6.8) is the largest island in the British Isles (excluding Mainland Britain and Ireland themselves), and has an area of 841.32 mil², which is well over twice the size of Mainland Shetland, and over four times the size of Mainland Orkney. Despite its large interior, its dataset contains many ARs

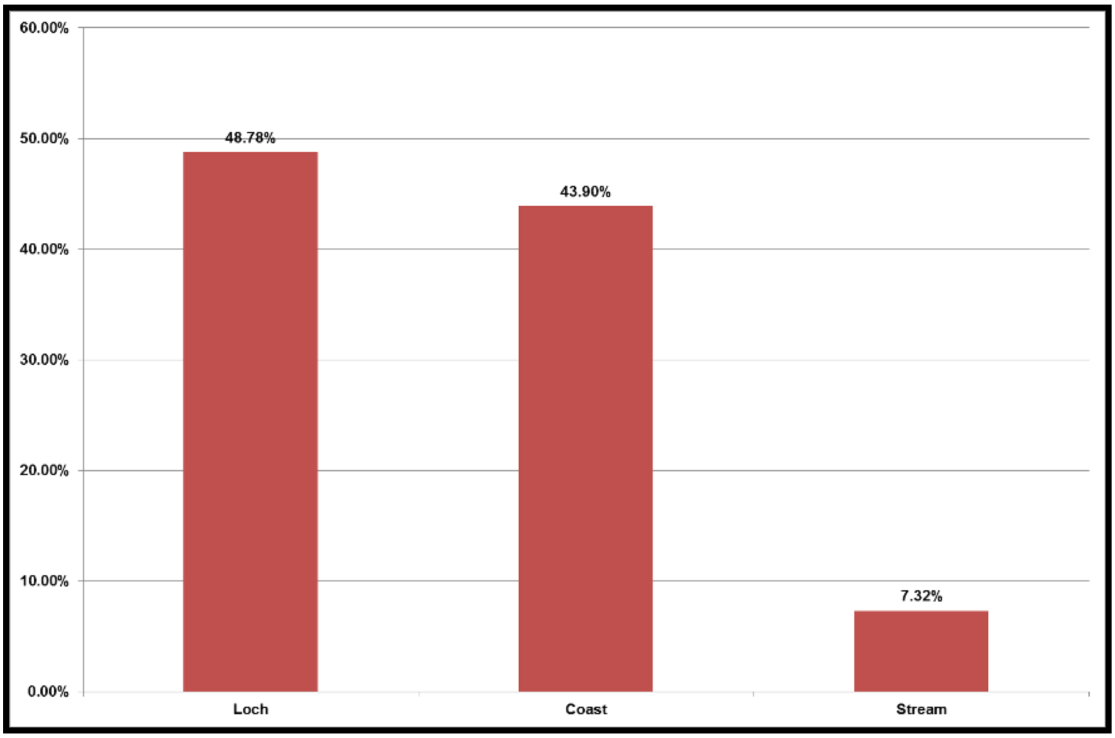
Figure 6.8. ARs on Lewis and Harris according to their nearest water body.



within a mile of the coast, at 92.68% (38), with the remaining 7.32% (3) within one and three miles. This may seem strange considering that Lewis and Harris has such a large interior for the locating of inland sites, but it should be noted that the inland areas of Lewis and Harris are actually quite inhospitable, with blanket peat and rocky hills dominating (Armit 1996: 3; Rennell 2010: 52). Indeed, the substantial but fragmented bays of Lewis and Harris are the areas which have been the most intensively cultivated in historic times (Armit 1996: 28), and so would likely explain the location of sites near the coast.

We find that 26.83% (11) of the dataset for this island are within 25m of the shore; 41.36% (17) are within 100m, and 48.78% (20) are within 500m, with the remaining 51.22% (21) outside this range. Therefore, many are positioned close to the shore, and the coast is the nearest water body for 43.90% (18), as seen in Figure 6.9, with not one of these eighteen ARs more than 130m from the shoreline. The majority of ARs however, at 48.78% (20), actually favour loch-side positions, and indeed, a very close proximity to lochs seems extremely prevalent in the Outer Hebrides. For the twenty ARs located nearest to lochs, seventeen are within only 10m of the water's edge – literally within the lochs

Figure 6.9. Nearest Water Body for ARs on Lewis and Harris.



themselves – and the remaining three are all within 250m. Further, the three ARs located nearest to streams are all within easy walking distance of these features. With all this in mind, we can see that for Lewis and Harris, proximity to the sea and lochs was common.

North Uist

To the south of Lewis and Harris is North Uist (Figure 6.10), which has an area of 116.99 mil², and is thus much smaller than its northern counterpart. However, 57 of its 82 ARs are within a mile (69.51% of the dataset) of the shore, with another twenty-three (28.05%), between one and three miles, and two others over three miles away. This is a comparably lower percentage than the datasets from the other islands of the Western Isles as we shall see. Indeed, 15.85%

Figure 6.10. ARs on North Uist according to their nearest water body.
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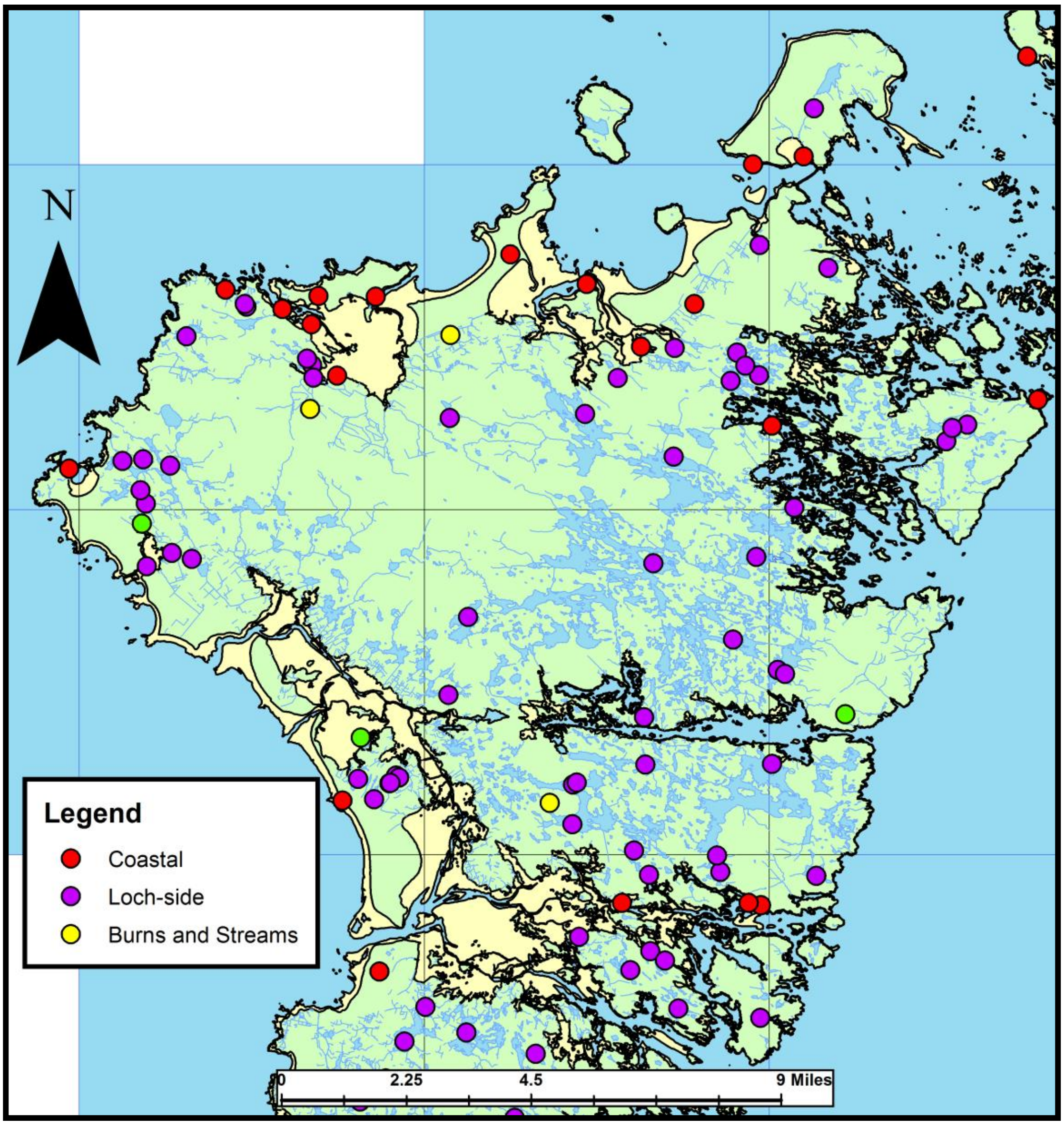
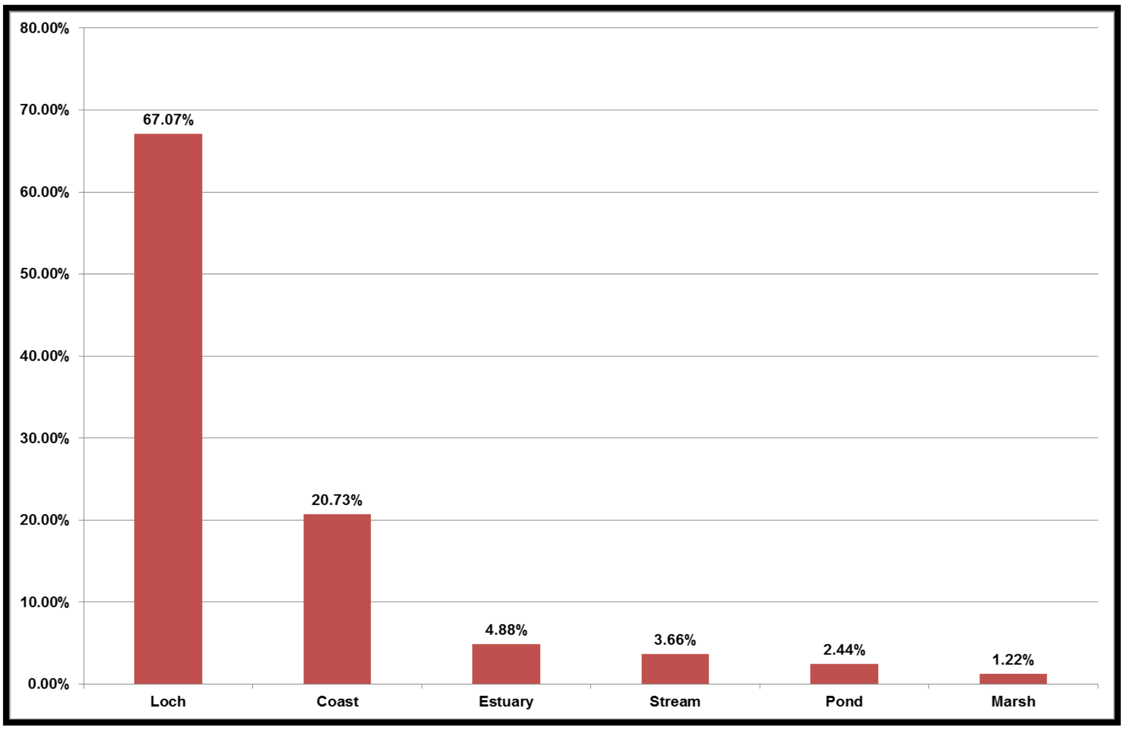


(13) of North Uist's ARs are found within 100m of the shore, and only 30.49% (25) are within 500m of the coastline; representing a significantly lower proportion of the dataset when compared to many other islands across Scotland. For example, Skye, which represents a much larger island, boasts 67.05% (59) of its ARs within 500m of the shore. Mainland Shetland, which is over three times the size of North Uist, possesses 72.46% (50) within the same distance; and Mainland Orkney, which is 84.94mil² larger than North Uist, has 53.57% (30) within 500m.

The coast is the nearest water body for only 20.73% (17) of the dataset (see Figure 6.11), with lochs being much more popular locations for ARs at 67.07% (55). This is unsurprising however, because, although Lewis and Harris have large areas of interior moorland (and comparably few lochs) - thus making it likely that ARs here are to be positioned nearer to the coast (and thus the most fertile land) - North Uist is uniquely abundant in low-lying lochs, and these are clearly utilised in the Iron Age (see Figure 6.12). Indeed, ARs on North Uist tended to fall within two zones: those ARs within the north and west machair/coastal landscapes (the most productive land for agriculture, and where settlement has been focused in recent centuries; see Armit 2002: 19; cf. Angus 2001), and those upon islet settings within lochs in the peatland

Figure 6.11. Nearest Water Body for ARs on North Uist.



landscapes (which are more numerous), mainly focused on the interior of the island; though it should also be noted that the dense distribution of peat in North Uist almost certainly masks many other sites here.

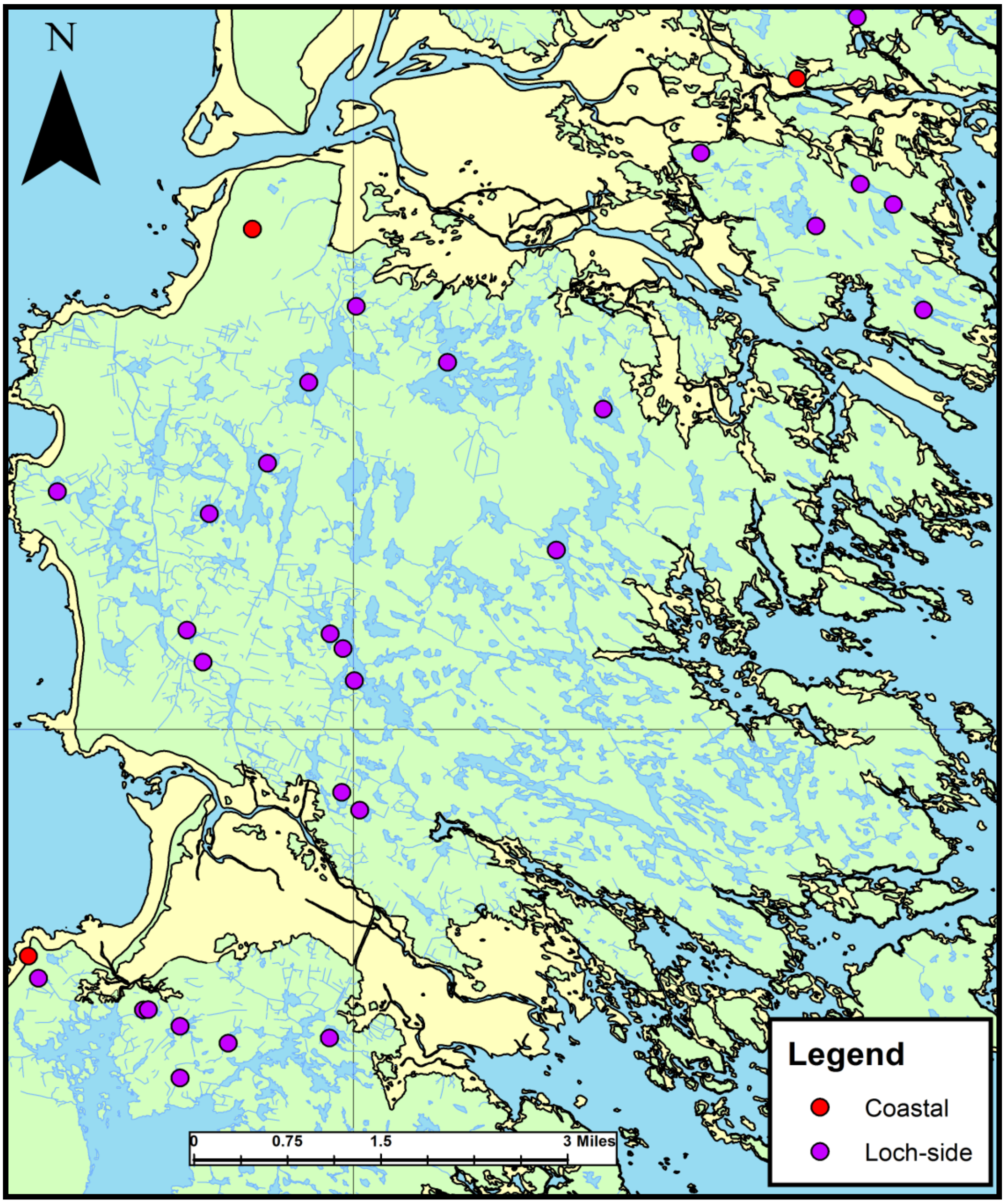
Out of the 55 ARs located near lochs (67.07% of the North Uist set), 45 are within 10m of the waters edge (most of which could be categorised as ‘island duns’); 50 are within 30m, and all of them are within 270m. Other types include four sites located within 20m of estuaries; three sites within 350m of local streams; one site set within marshland, and two others located within 350m of natural ponds. The ARs on North Uist thus suggest a very strong engagement with water - as we would expect within such an environment - and hints towards an aquatic culture to be compared with that of Orkney and Shetland, as briefly explored in Chapter Five.

Figure 6.12. Dun an Sticir, North Uist.

Benbecula

The small island of Benbecula (Figure 6.13) has an area of only 31.66 mil², but despite this, the coastline was seldom sought in lieu of the interior. Out of the sixteen sites on the island, only two are within 500m of the shore; and only one site has the coast as its nearest water body. The remaining fifteen are all located near lochs which fill much of the interior of the island, and fourteen of these are within 15m of the water's edge itself – thereby constituting either island duns or loch-side sites. Only one, Dun Shunish, is located further than 15m from its loch, at 325m. For the sites on Benbecula then, the watery context of the loch was certainly significant. However, it is notable that many of these lochs are also located towards the more fertile and cultivated west coast; away from the eastern side of the island, which largely consists of a mixture of freshwater lochs, moorland, bog and deeply indented sea lochs.

Figure 6.13. ARs on Benbecula according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



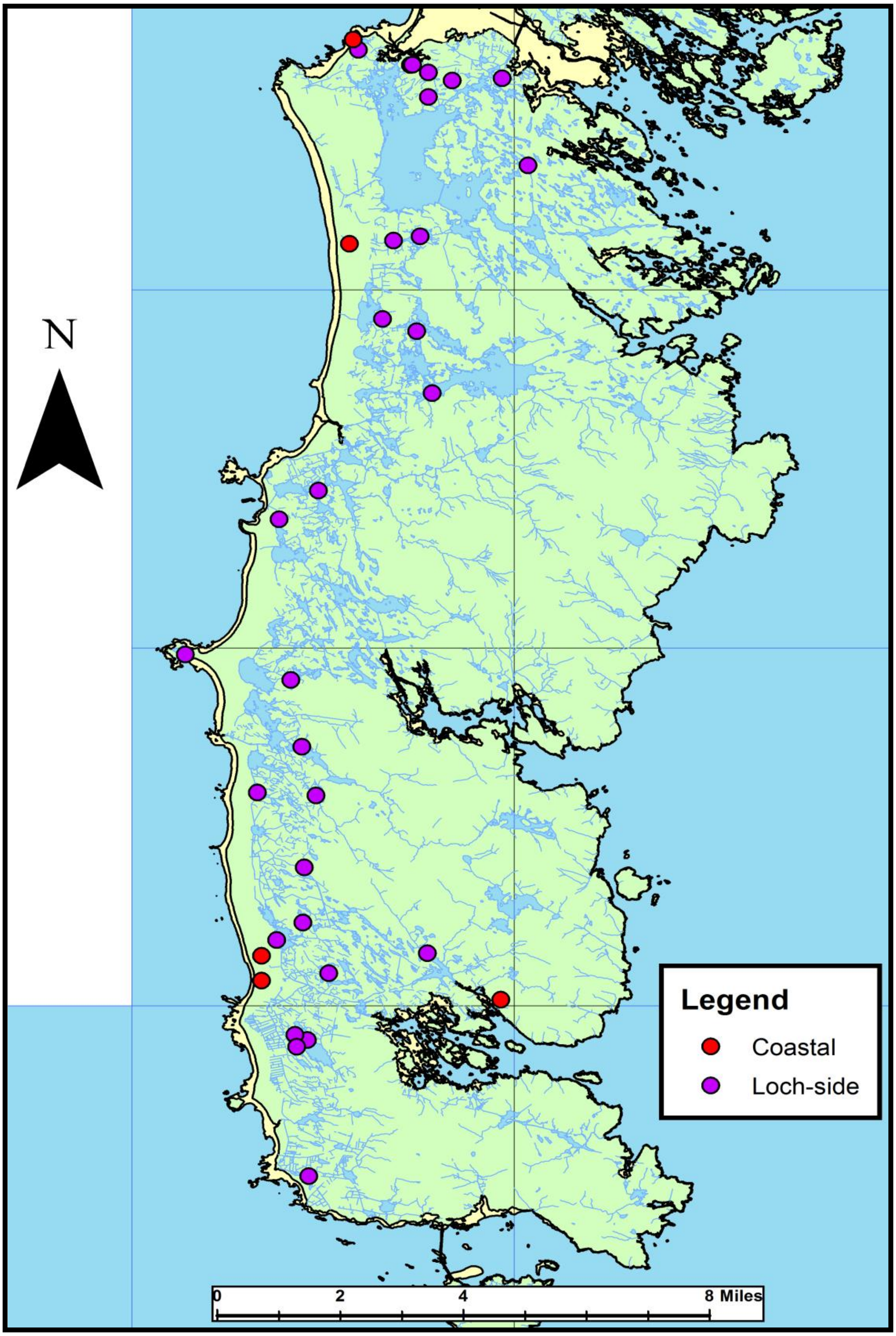
South Uist

South Uist (Figure 6.14) is fairly similar to the pattern of North Uist and Benbecula. 64.71% (22) of the dataset is located within a mile from the coastline; with the remaining 37.14% (13) between one and two miles. However, only two ARs (2.94%) are set within the first 100m of the shoreline, significantly lower than the datasets from Orkney and Shetland as shall be explored below. Much like North Uist, interior sites seem to have been favoured, and in fact, only 26.47% (9) of the dataset is found within 500m of the shoreline. Indeed, for only 14.71% (5), the coastline is the nearest water body, as seen in Figure 6.15, with the remaining 85.29% (29) ARs found closer to lochs.

To explore the reasons for this, we should briefly explore the geography of South Uist, which can be divided into three zones: (1) a mountainous and inhospitable eastern coast (which ARs almost entirely avoided), dominated by peat and small lochans; (2) a narrow central strip known as the 'blacklands', with thin acidic soils formed from peat which can be improved by manuring and the addition of shell sand; and (3) the fertile machair forming the western coastal strip (Macdonald 1811: 784-785; Mackay 1980: 74; MacLean 1837: 186-187; Parker Pearson, Sharples and Symonds 2004: 9). Like settlements in South Uist today, ARs are to be found within the extensive freshwater lochs on the blacklands or upon the fertile machair plain on the west coast. However, that being said, although some ARs were positioned on the fertile machair near the coast, it seems to have been much more common for ARs to be positioned within the freshwater lochs located to the east of this machair strip, and this tells us much about how Iron Age inhabitants interacted with their landscape upon this island.

Indeed, the Iron Age geography of South Uist - together with the fact that most ARs were positioned within the freshwater lochs of the blacklands - would have meant that the main access routes to these sites would have been north-south by boat. Indeed, in South Uist, one need not have risked the coastal route as there was the option of travelling along the many interconnecting lochs that exist between the fertile machair and the peat land on the eastern side of the islands (Parker Pearson and Sharples 1999a: 12). This watery and networked landscape is almost certainly the reason why South Uist possesses so many island/loch-side ARs, as opposed to purely coastal promontory ARs like we see in Orkney and Shetland (as explored briefly in Chapter Five); allowing many of these sites to be connected by water; something seemingly unmatched

Figure 6.14. ARs on South Uist according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



elsewhere in Atlantic Scotland. Indeed, twenty-four of the twenty-nine ARs nearest to lochs are all within 20m of the water's edge, with the furthest being 140m away. To define these sites as inland then would be in error as most are only accessible by boat and include sites such as: Loch an Duin, Duin Duichal,

Figure 6.15. Nearest Water Body for ARs on South Uist.

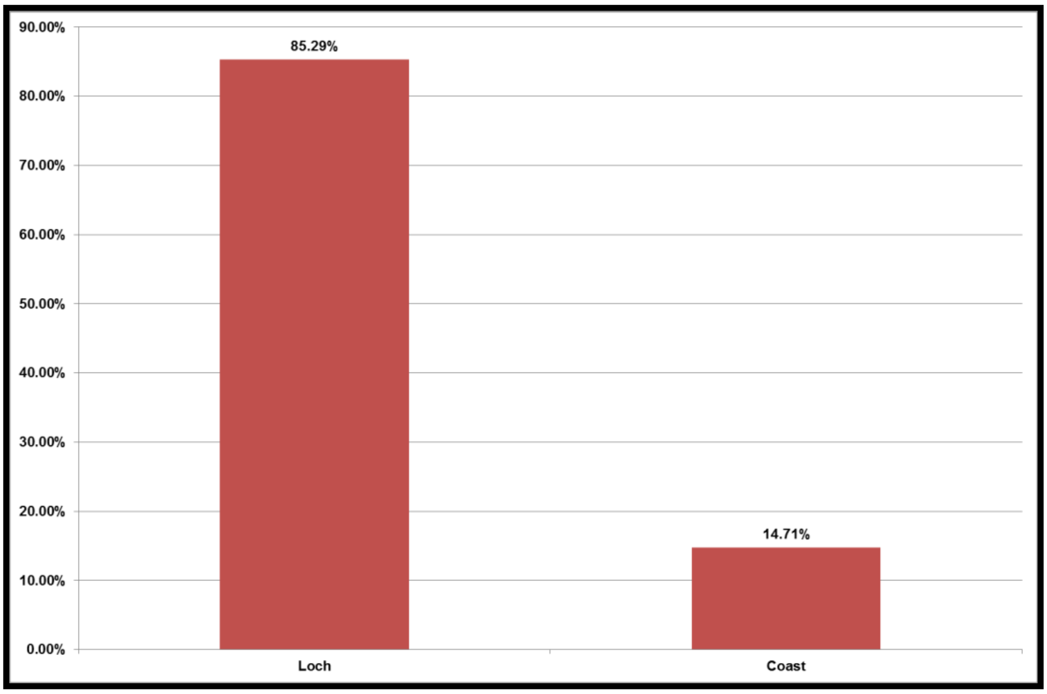
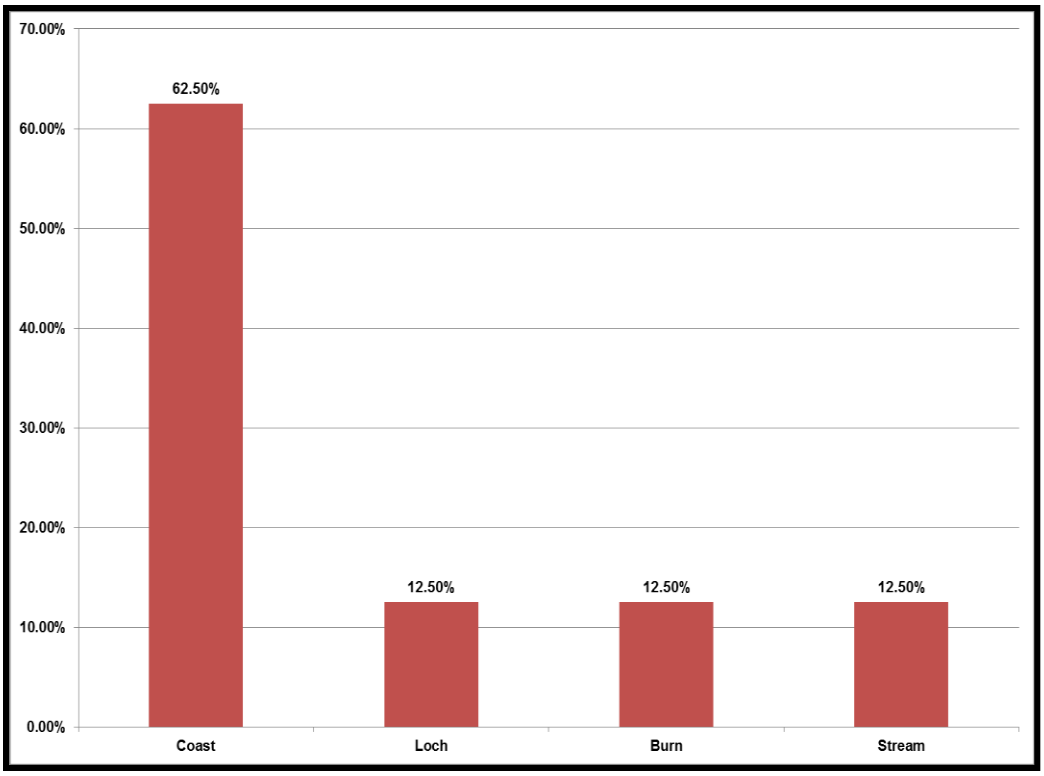


Figure 6.16. Nearest Water Body for ARs on Barra.

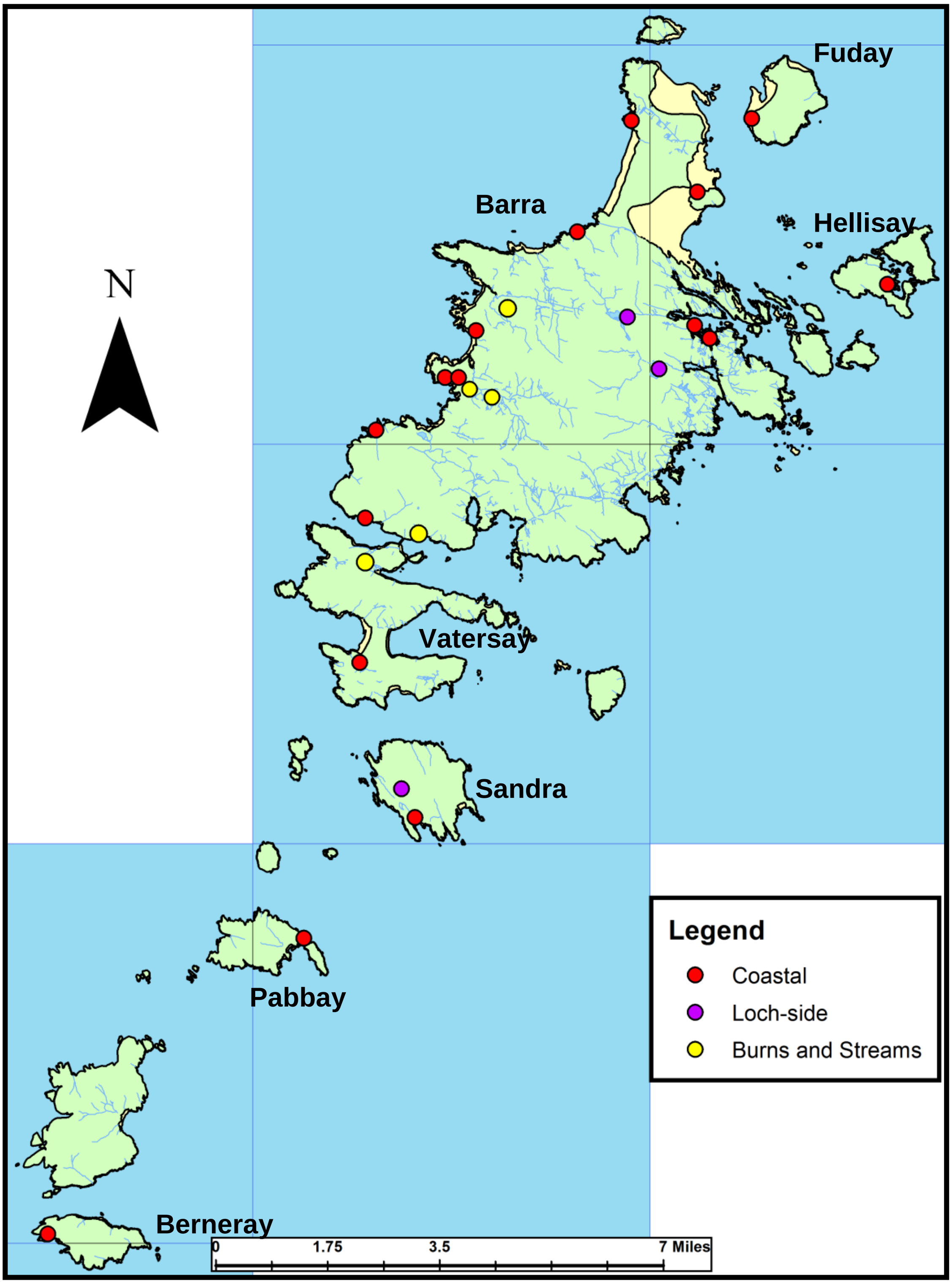


Loch an Duin, Loch an Eilean, Eilean an Staoir, upper Loch Bornish, Altabrug, Dun Buidhe, Dun Cille Bhanain, Dun Uiselan, and the two in Loch an Duin Bhuidhe.

Barra

Further south is Barra, which is much smaller than its northern counterparts and has an area of only 9.54, mil^2. Unlike the Uists, Barra possesses many coastal ARs, as seen in Figures 6.16 and 6.17, with 62.50% (10) its ARs found closest to the shoreline. Indeed, 31.25% (5) lie within 25m; 50% (8) are within 100m, and 75% (12) are within 350m of the coast. Two ARs are located within lochs, and the other four are found closest to burns and streams; none of which is 200m away from a water source. The sites located upon the smaller islands around Barra are predominantly coastal, excluding two sites; one located near a local stream, the other a loch.

Figure 6.17. ARs on Barra and its associated islands according to their nearest water body.

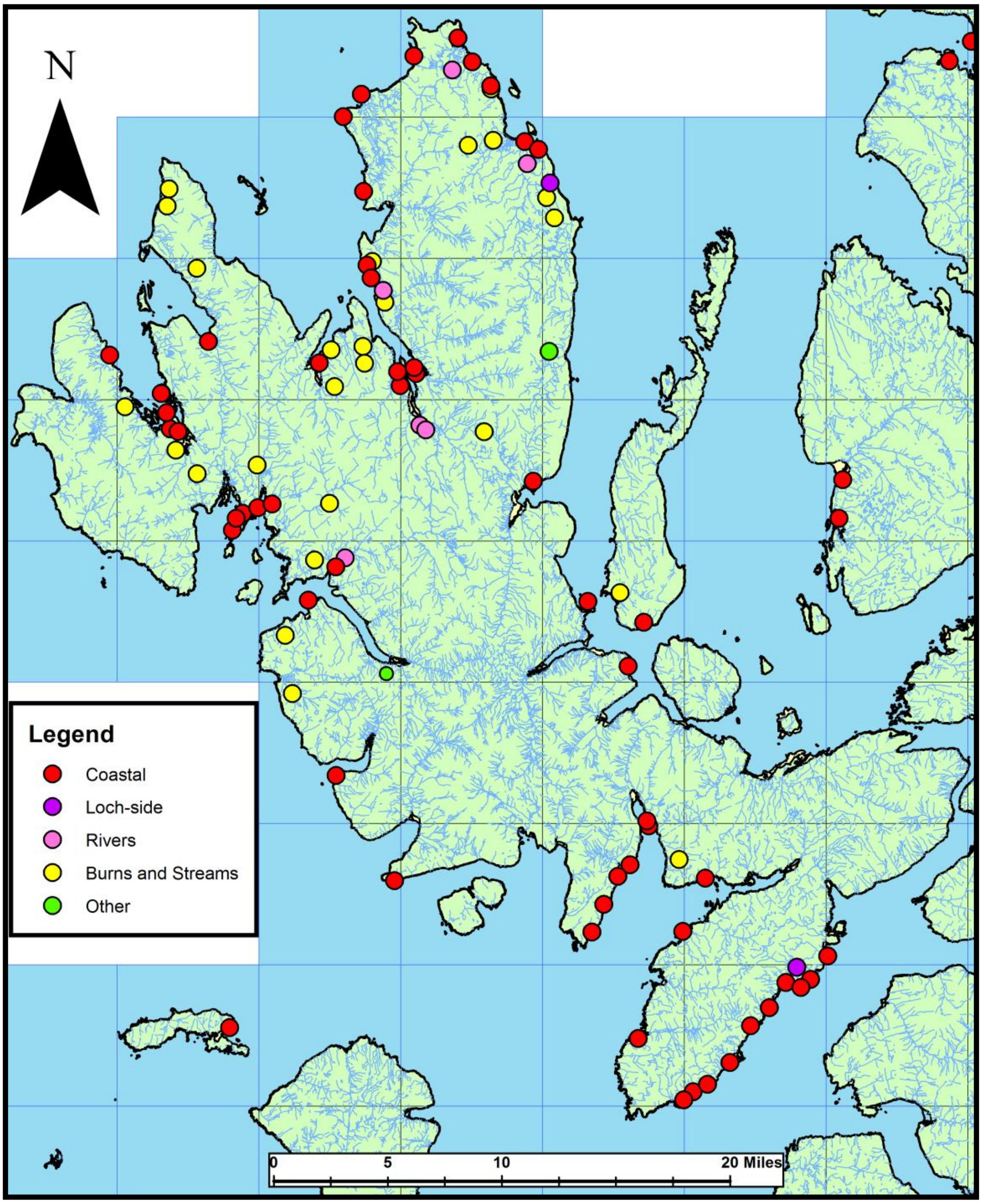


The Inner Hebrides

Skye

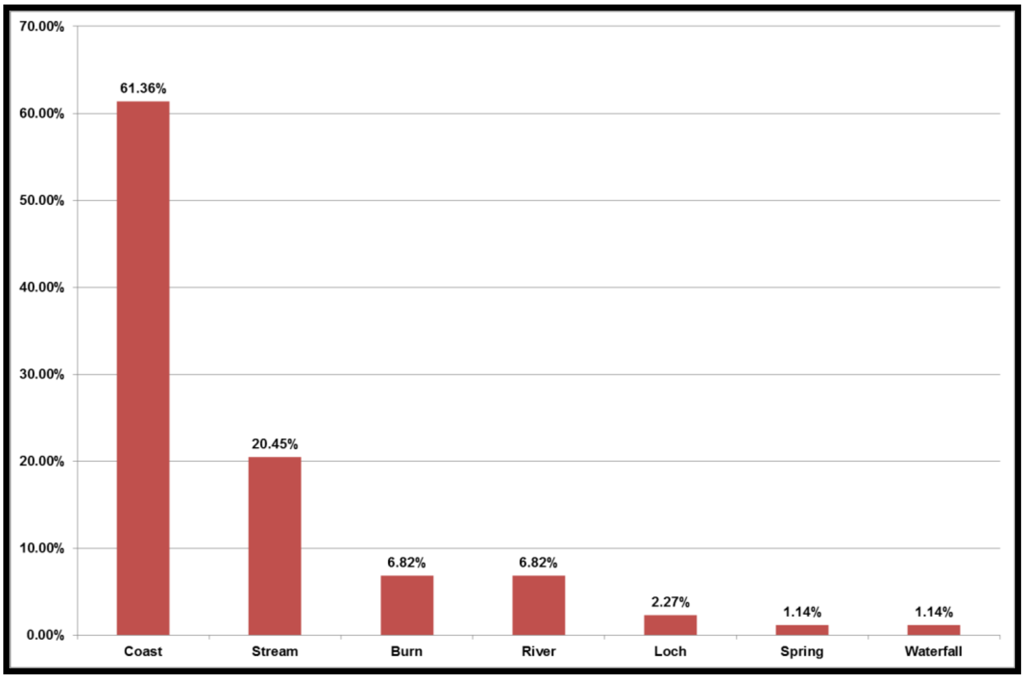
The Isle of Skye (Figure 6.18) is the second largest island in Scotland, and with an area of 639.39 mil², it is over three times the size of Orkney Mainland. Despite its large interior however, a large proportion of its Iron Age sites are found within a mile of its shoreline (88.64% - 78 ARs), with the remaining

Figure 6.18. ARs on Skye according to their nearest water body.



11.36% (10) between one and three miles; probably as the result of its mountainous interior. Indeed, the coast is in close proximity to many of Skye's sites, with 25% (22) within 50m; 40.91% (36) within 100m, and 67.05% (59) within 500m of the present shoreline; unsurprising considering that some of the most fertile soil on Skye is to be found near the coast (Birks 1973); especially on the island's northern side. Indeed, as seen in Figure 6.19, the nearest water body for 61.36% (54) of Skye's dataset is the coast itself. The majority of Skye's other sites are located in closer proximity to burns, streams or rivers, making up 34.09% (30) of the Skye dataset. Out of these, twenty-five are within 350m of the nearest water body, and the rest lie within 420m – a short walk, depending on topography.

Figure 6.19. Nearest Water Body for ARs on Skye.



Mull

With an area of 337.84mil², Mull, Figure 6.20, is the fourth largest island in Scotland, and is larger than Mainland Orkney, North Uist and South Uist. With a mountainous and largely infertile interior, no ARs on Mull are found in the core of the island itself, with most being located in the comparably fertile coastal areas in the north-west corner. A large proportion of ARs are thus within a mile of the shore, at 97.22% (35), with one site being just outside this range. 33.33% (12) are within 100m of the shore, and 61.11% (22) are within 350m of the shoreline; suggesting a coastal focus for many of the sites here (see Figure

Figure 6.20. ARs on Mull according to their nearest water body.

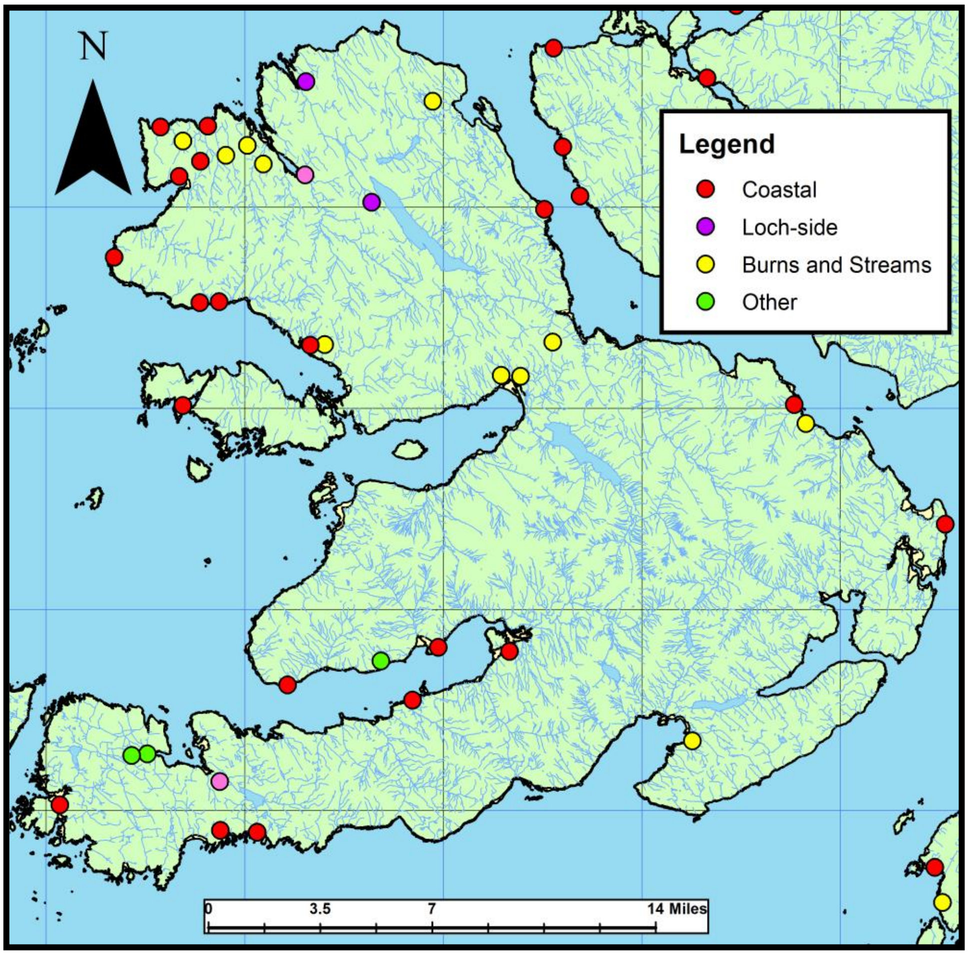
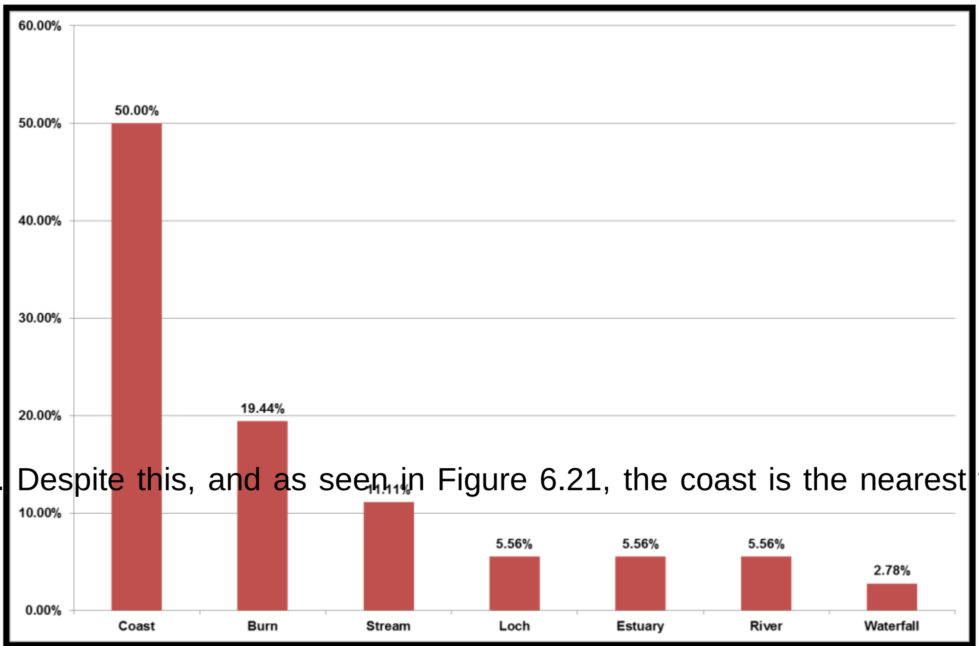


Figure 6.21. Nearest Water Body for ARs on Mull.



6.21). Despite this, and as seen in Figure 6.21, the coast is the nearest water body for only 50% (18) of Mull's dataset (also see Figure 6.22). Another 36.11% (13) are found closer to burns, streams and rivers, with no site more than 350m

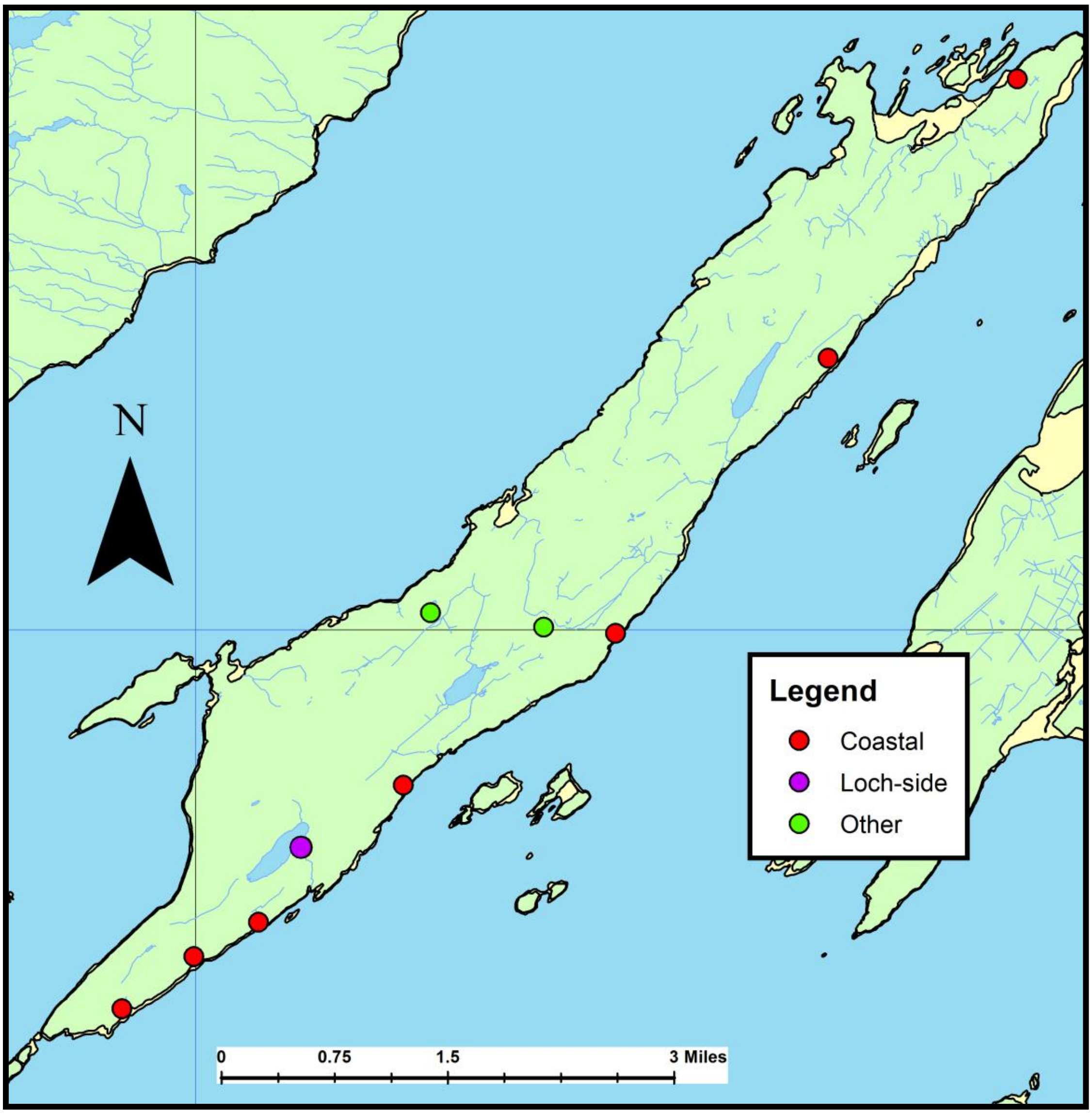
Figure 6.22. Dun Calgary, Mull, overlooking Calgary Bay.

away from such features.

Lismore

Though much smaller than many of the other Hebridean islands, with an area of only 9.27mil², Lismore (Figure 6.23) possesses ten ARs; probably due to the fact that it includes some of the most fertile soils in the Inner Hebrides (indeed, 'Lismore' means 'great garden' in Gaelic). Considering that the coast is never more than a mile away on Lismore, it is unsurprising that seven of its ten ARs have the shore as its nearest water body; and all of these are within 130m of the coastline. Two others are within 80m of a loch, and the last is 240m from its nearest spring.

Figure 6.23. Sites on Lismore according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.

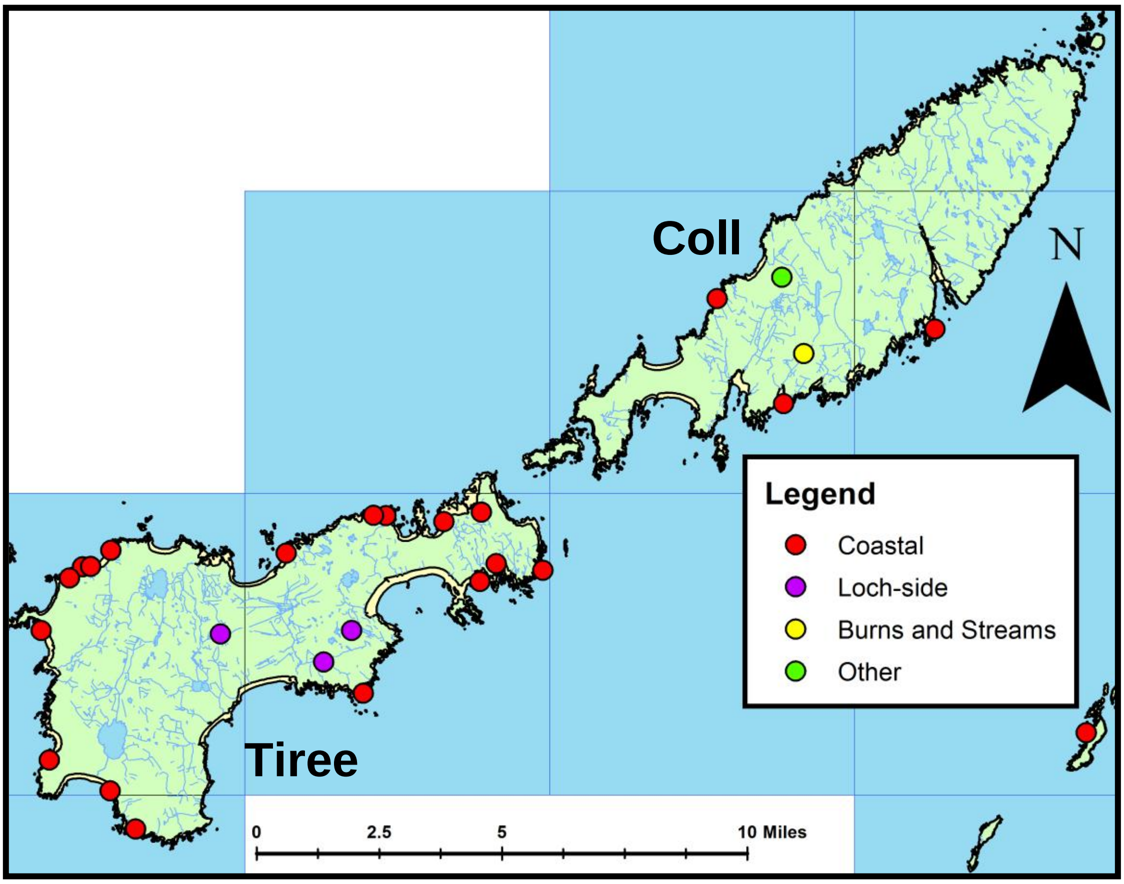


Coll and Tiree

Coll (Figure 6.24), with an area of only 29.73mil², possesses five ARs, three of which are within 111m of the coastline. The two others are more than 500m away from the shore, though both are within 240m of a water source. All these ARs are focussed towards the western end of the island where the quality of the land is better. Nonetheless, the nature of the land on this island is still in contrast to the very fertile land found on neighbouring Tiree.

Tiree (Figure 6.24), though slightly larger than Coll at 30.12mil², possesses an abundance of ARs and these are obviously more coastal (with a clear focus on the fertile machair), with the coast being the closest water source for seventeen of its twenty ARs; twelve of which are within 100m of the shoreline. Sixteen ARs are within 250m, however the remaining four are further inland, one of which is 950m from its nearest water body. Nevertheless, the dominance of ARs on the shoreline here suggests a primarily coastal focus here.

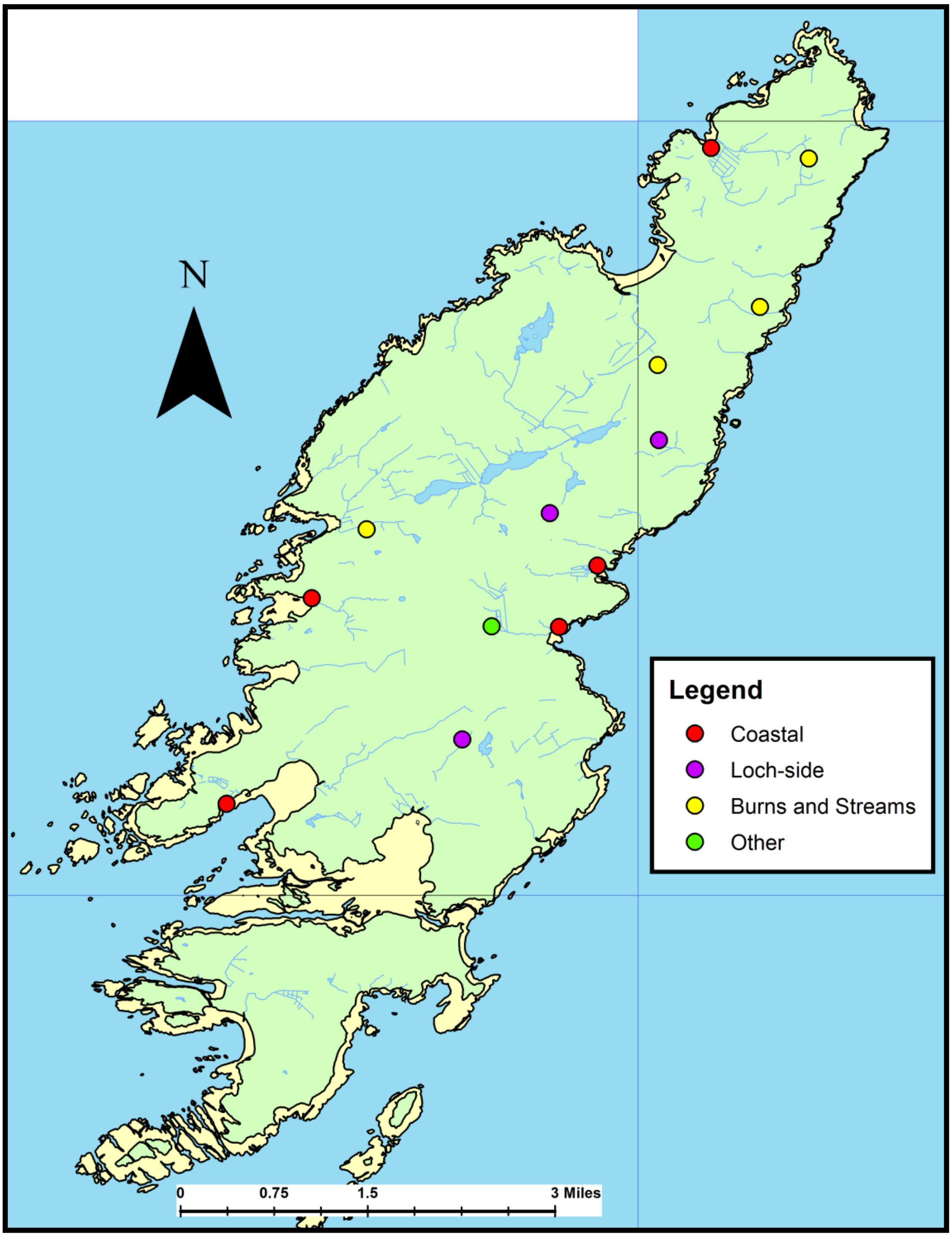
Figure 6.24. Sites on Coll and Tiree according to their nearest water body.



Colonsay

With an area of only 15.83mil², Colonsay (Figure 6.25) is slightly smaller than the Orcadian islands of Sanday, South Ronaldsay, Rousay and Westray. And yet, unlike these other larger islands, the coast is not the focus of attention as only five of its thirteen ARs are situated closest to the shore. Across Colonsay, four are within 100m of the shoreline, and less than half (only six) are within 500m; usually overlooking the few narrow inlets and bays on the island. Unlike many other islands in the Outer and Inner Hebrides (e.g. Lewis and Harris) however, Colonsay possesses a somewhat sheltered and fertile interior, and it may be for this reason that the majority of ARs are located within it. The nearest water body for three are streams, all of which are within 100m of these features; further suggesting a desire to be in proximity to fertile land. Three others are located within 300m of their nearest loch; one is within 70m of a marsh and another lies at a moderate distance of 580m away from its nearest water body – a burn.

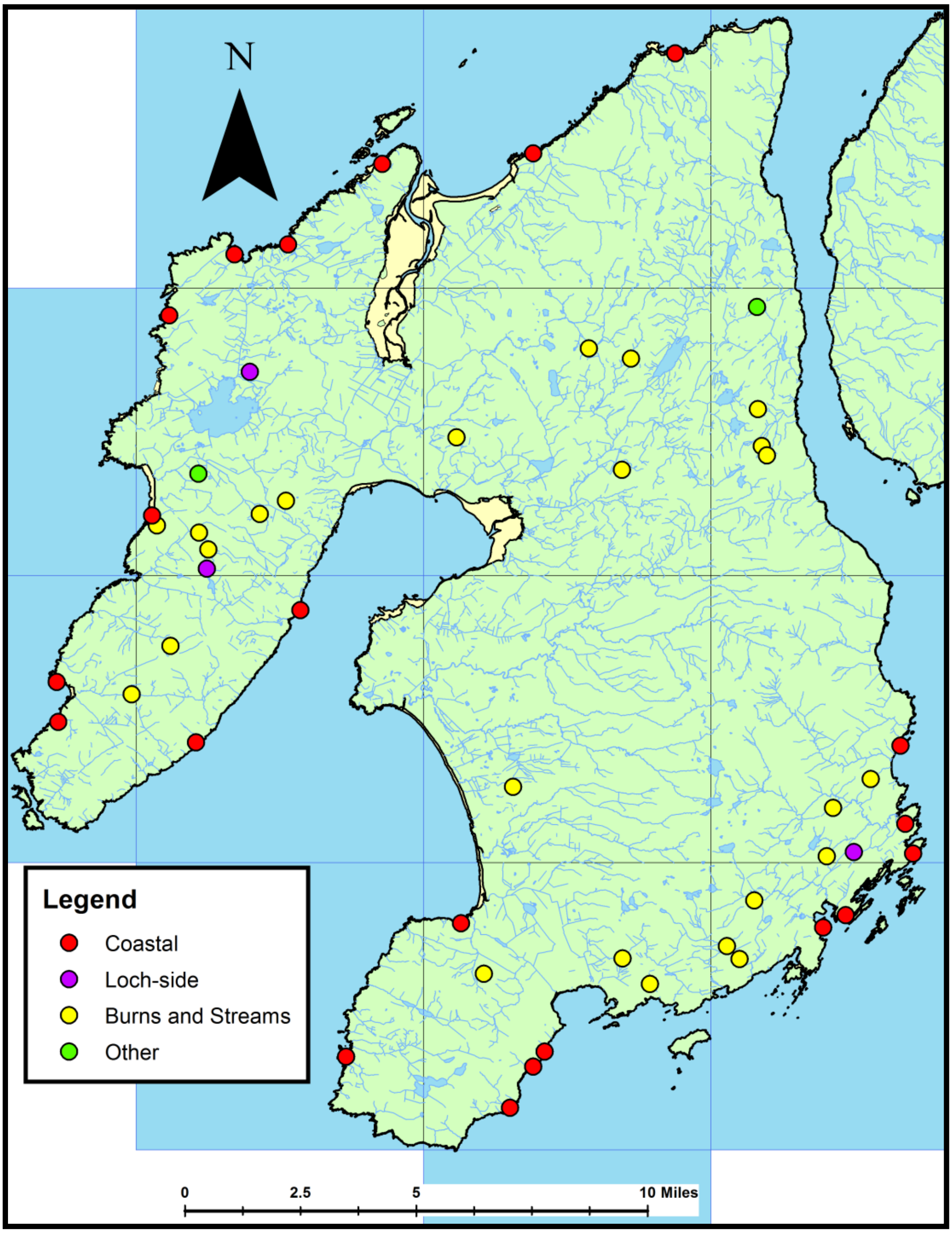
Figure 6.25. Sites on Colonsay according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



Islay

Islay (Figure 6.26), with an area of 239.38mil², is the fifth largest island in Scotland, smaller than Mull, but larger than Mainland Orkney. The sea is again the object of attention for many ARs here, with 67.35% (33) located within a mile of the coast; 28.57% (14) are between one and three miles, and two other sites lie beyond this distance. The coast is the nearest water body for only 40.82% (20) of the dataset however, as seen in Figure 6.27, and all of these are

Figure 6.26. Sites on Islay according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



within 140m of the shoreline. Taken altogether however, 30.61% (15) of the entire Islay dataset is within 100m of the shore, and less than half the dataset (44.90% - 22) lies within 500m. This is probably due to the fact that Islay, like Lismore, is low-lying and abundant in fertile land, unlike many other Hebridean islands - particularly in comparison to the Isle of Mull whereby 61.11% of its ARs were found within 350m of the shore (suggesting an avoidance of the infertile interior here). Indeed, Islay is often considered to be the most fertile of the Hebridean islands, and is often referred to as the 'Queen of the Hebrides' (Newton 1995: 11); and it is probably because of this that Islay, though smaller than Mull, was accommodated with more ARs (49 on Islay in comparison to 36 on Mull).

Three sites on Islay are located a moderate distance away from lochs, and one other is located near a natural pond. However, for many (48.98% - 24), the nearest water bodies are streams and burns. Seven of these are within 100m; twenty within 250m and all are within 400m of these water features; suggesting a desire to be in proximity to the fertile land around these areas.

Figure 6.27. Nearest Water Body for sites on Islay

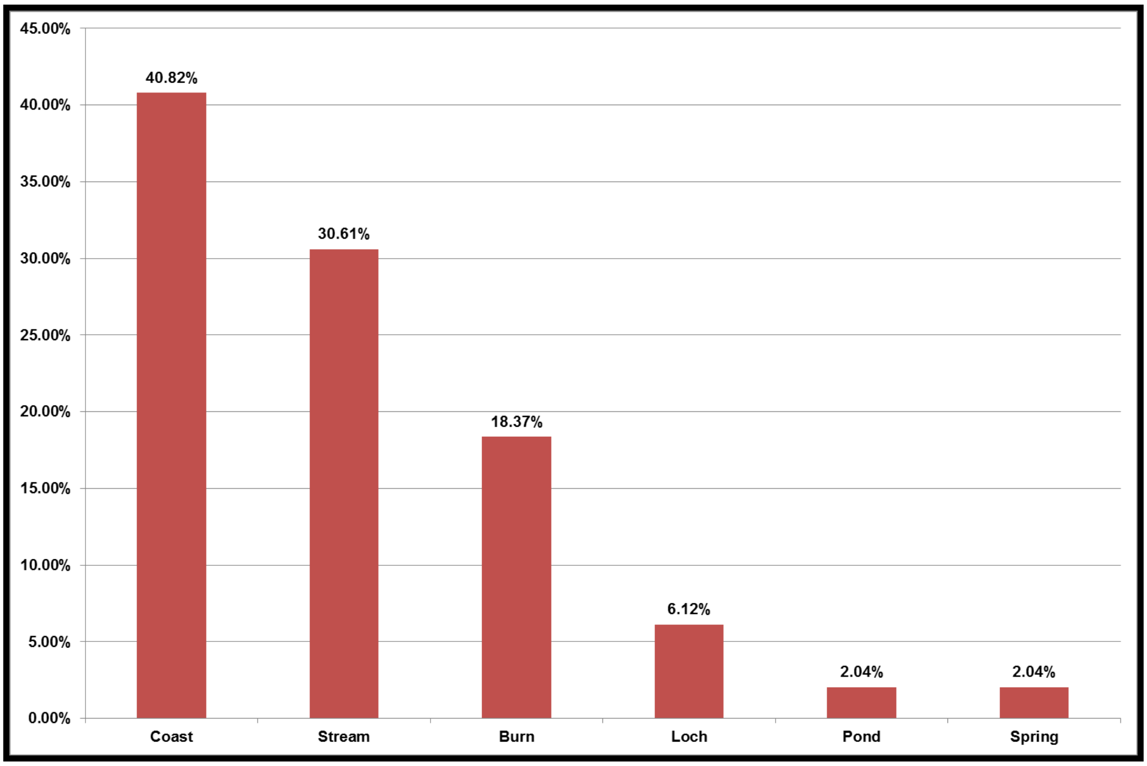
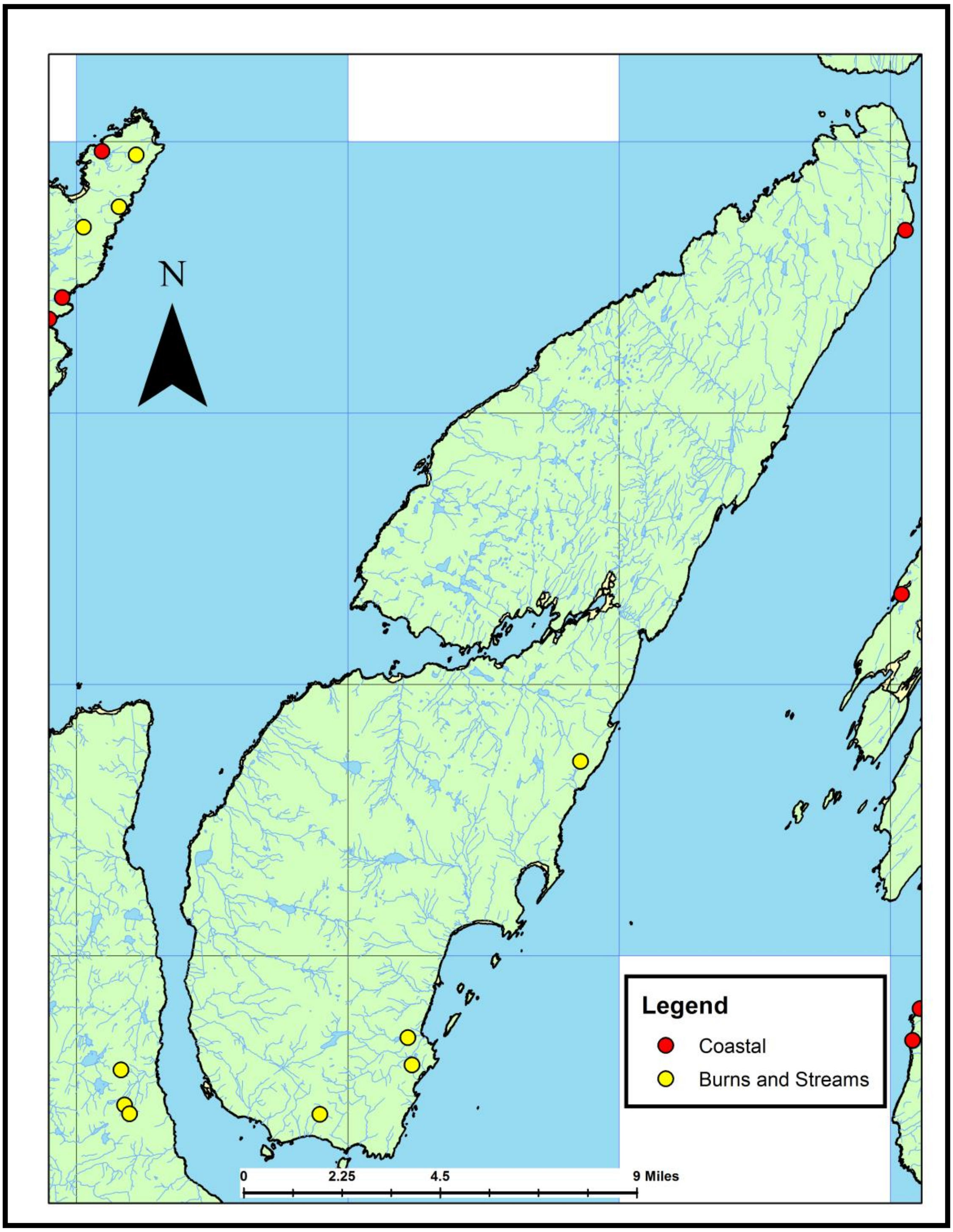


Figure 6.28. Sites on Jura according to their nearest water body.



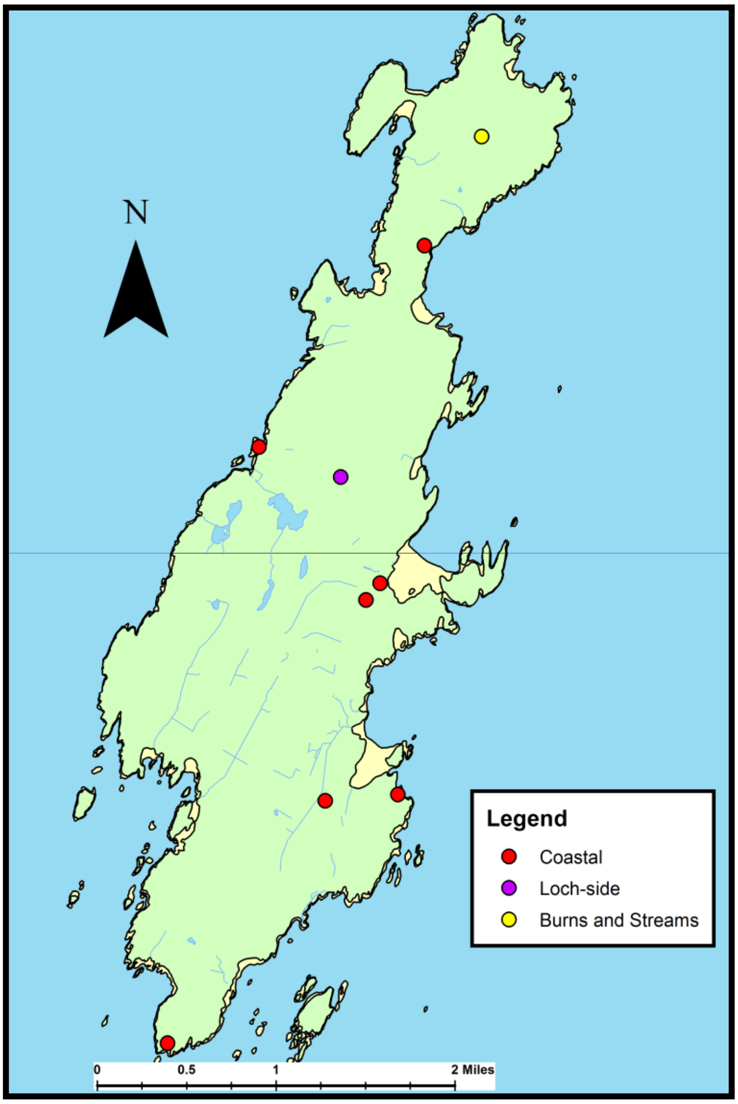
Jura

Jura (Figure 6.28) possesses only six sites, which may seem odd when considering that its area is 141.70mil² - therefore making it larger than both North and South Uist. But unlike neighbouring Islay, much of its hilly interior is peat bog and moorland. Indeed, Jura, which is made up of infertile metamorphic quartzite, is virtually uninhabited even today, and this probably explains the scarcity of ARs here; with all six of its ARs being located on the periphery of its eastern side where the land is comparably better. Interestingly, despite it being centrally located within what one may assume to have been the main seaway between Argyll, Colonsay and Islay, only two of its six ARs are positioned within 150m of the shoreline; the rest all located between 500m and 850m away. Therefore, though they do not mimic the ‘cliff-castle’ brochs of Orkney, they are nevertheless close enough to be regarded as coastal. The remaining sites are, however, located nearer to streams and burns, and all of these are within 200m of such features.

Gigha

The tiny island of Gigha (Figure 6.29) boasts nine ARs, despite having an area of only 5.39 mil²; probably the result of the island’s reasonably fertile soil. Four lie within 100m of the shoreline, and seven are within 270m. The remaining two are located outside the 500m range, and both are oddly positioned further afield; located over 400m from their nearest water source; one a stream, the other, a loch. In comparison to the sites on the small islands on Orkney which are all positioned in very close proximity to the coast, and

Figure 6.29. Sites on Gigha according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



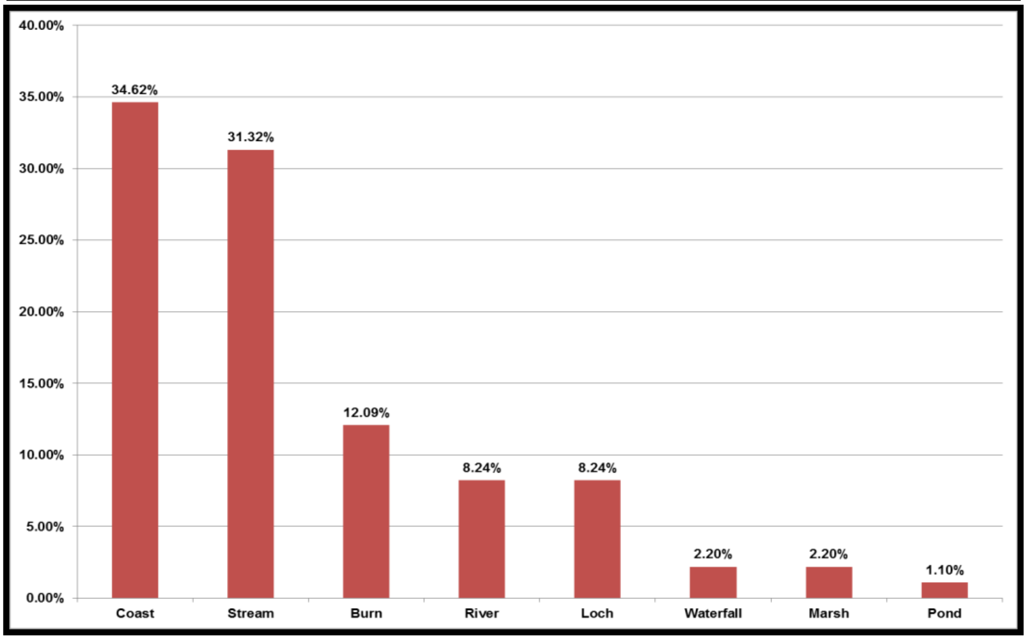
thus suggesting a wide field of contact, Gigha, as well as the other small islands in the Inner Hebrides (especially those with fertile interiors), tend to have sites further inland, suggesting an internal focus on the land for these communities.

Argyll and Bute Mainland

For the 182 ARs upon the Argyll and Bute Mainland (see Figure 6.30 and 6.31), 65.38% (119) are within a mile of the shore, whilst another 25.27% (46) are located between one and five miles, with the remaining 9.54% (17) being inland – i.e. more than five miles away from the sea.

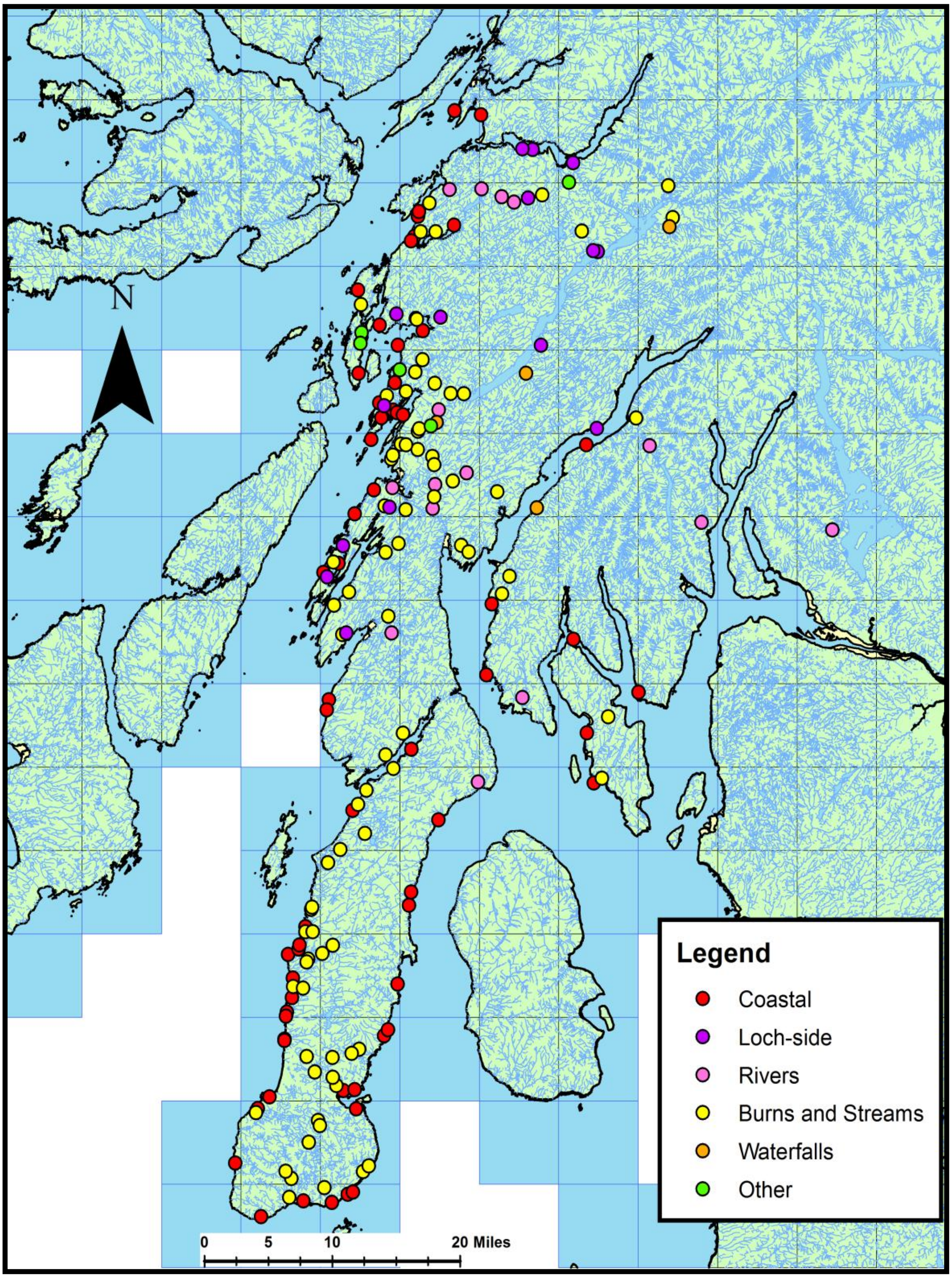
Considering proximity to the coast, 4.40% (8) are within 25m, 9.89% (18) are within 50m, 19.23% (35) are within 100m, 37.91% (69) are within 350m, and 43.96% (80) are within 500m of the shore; suggesting that many were positioned with coastal proximity in mind. Indeed, though Argyll and Bute constitutes part of Mainland Scotland, the coast is the nearest water body for quite a large proportion – 34.62% (63), as seen in Figure 6.30. In comparison to the Northern Mainland of Sutherland and Caithness, where only 16.87% (41) of the AR dataset is found closest to the shoreline (as we shall see below), one could suggest a focus on the coast for many Iron Age communities in Argyll and Bute then. This is unsurprising considering that travel by boat was probably the primary method of travel for the inhabitants of this area, with Argyll's hilly and rough interior probably making it difficult to have travelled solely by foot. Out of the sixty-three ARs whose nearest water body is the coast, 55.56% (35) of

Figure 6.30. Nearest Water Body for sites on the Argyll and Bute Mainland.



these are within 100m, 79.37% (50) are within 250m, and 92.06% (58) are within 500m of the shoreline.

Figure 6.31. Sites on Argyll and Bute Mainland according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



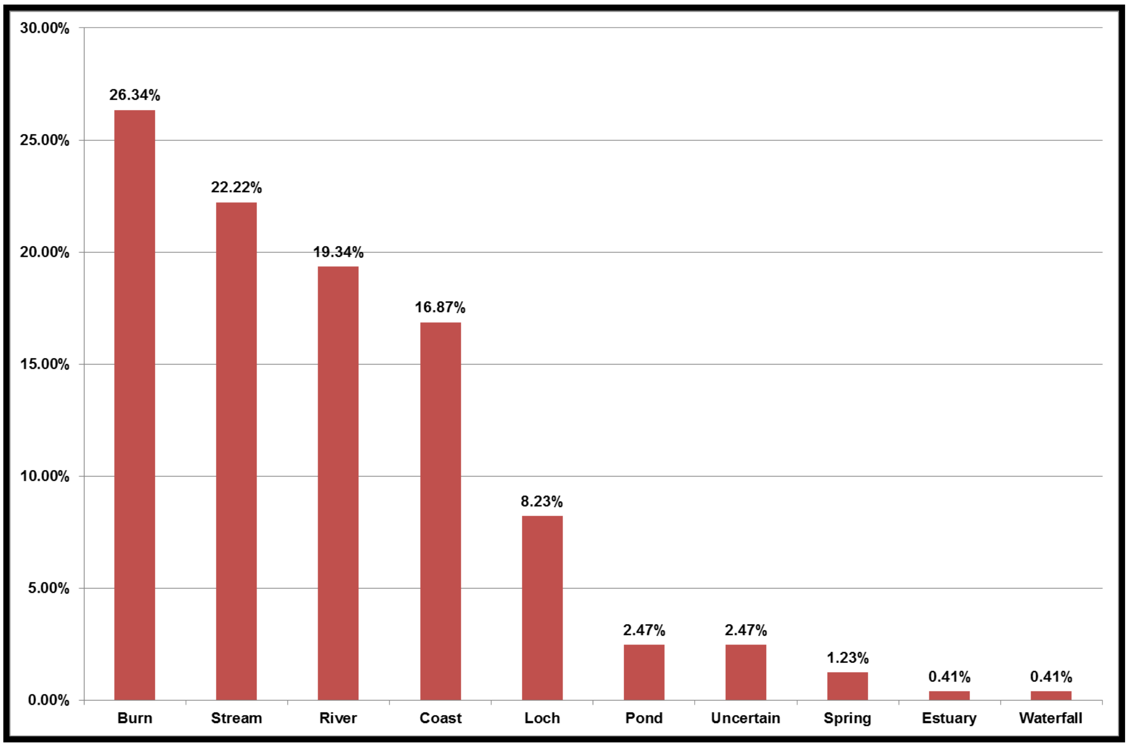
However, that being said, the majority of ARs from the entire dataset of Argyll and Bute – 51.65% (94) – are actually found closest to streams, burns and rivers; many of which are located within the fertile coastal areas of the Mull of

Kintyre and Knapdale. From these ninety-four ARs, 42.55% (40) are within 100m, 79.79% (75) are within 250m, and 97.87% (92) are within 500m of these water sources. For the fifteen ARs whose closest water body is a loch, thirteen are within 300m, and all fifteen are within 400m of the water's edge. Four other ARs are found within 100m of marshland, and another four are all within 250m of local waterfalls. Therefore, not one AR in Argyll and Bute is further than 700m from a water source, though the great majority are much closer than this, with many being located closest to streams and burns.

Northern Scotland: Caithness and Sutherland

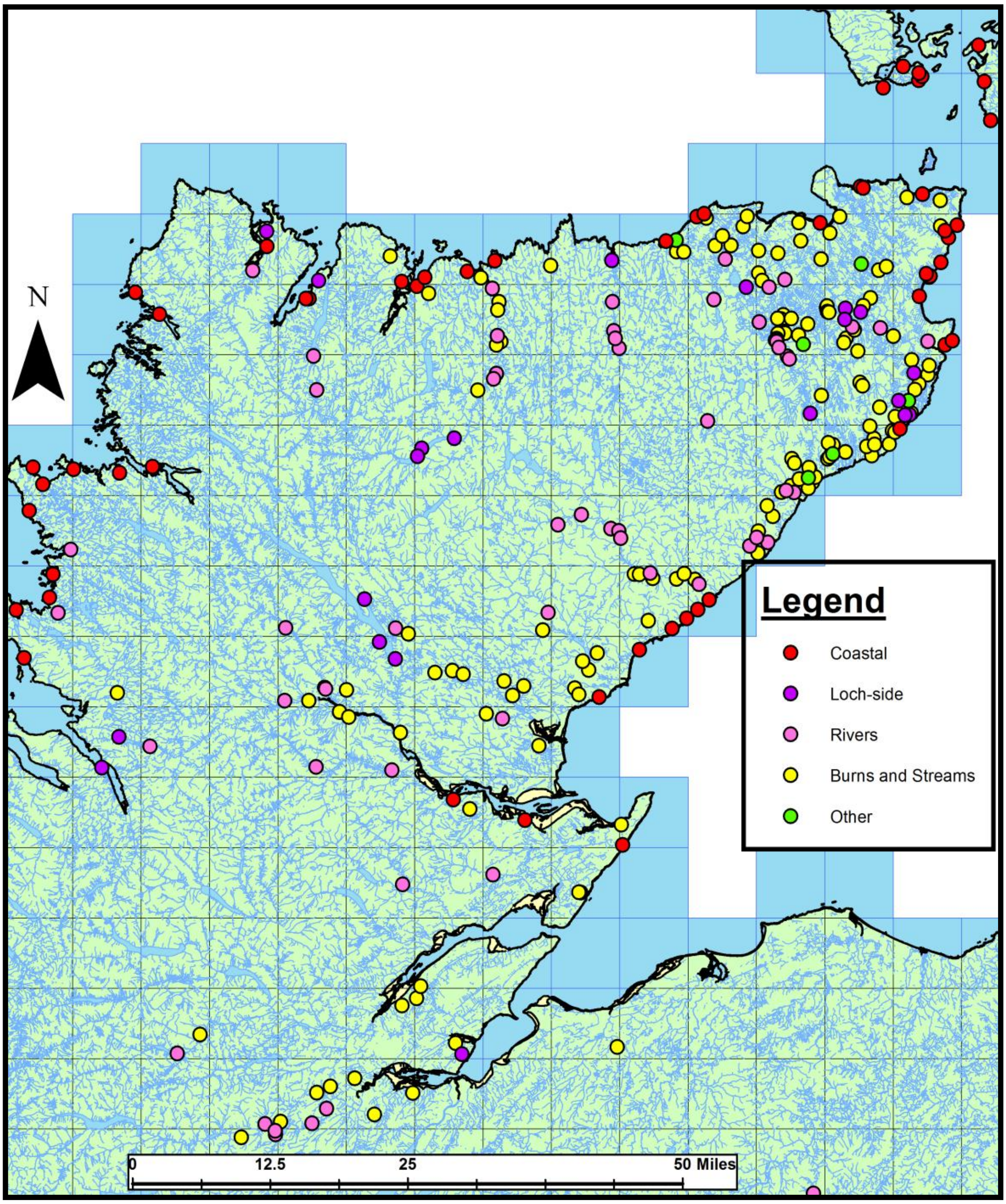
The Northern Mainland of Scotland (Caithness and Sutherland) (Figure 6.32 and Figure 6.33) possess many ARs, especially those that are generally considered to be brochs. Thought generally as coastal promontory sites, it is interesting therefore that out of 243 ARs in this region, only 30.35% (74) are

Figure 6.32. Nearest Water Body for sites on the Northern Mainland (Caithness and Sutherland).



within a mile of the shoreline, with 34.16% (83) between one and five miles, and a quite large proportion, 35.39% (86), being marked as inland (more than five miles). In contrast to ARs located in Orkney and Shetland (as we shall see below), Caithness and Sutherland possess far fewer distinctly coastal sites.

Figure 6.33. Sites on the Northern Mainland according to their nearest water body.



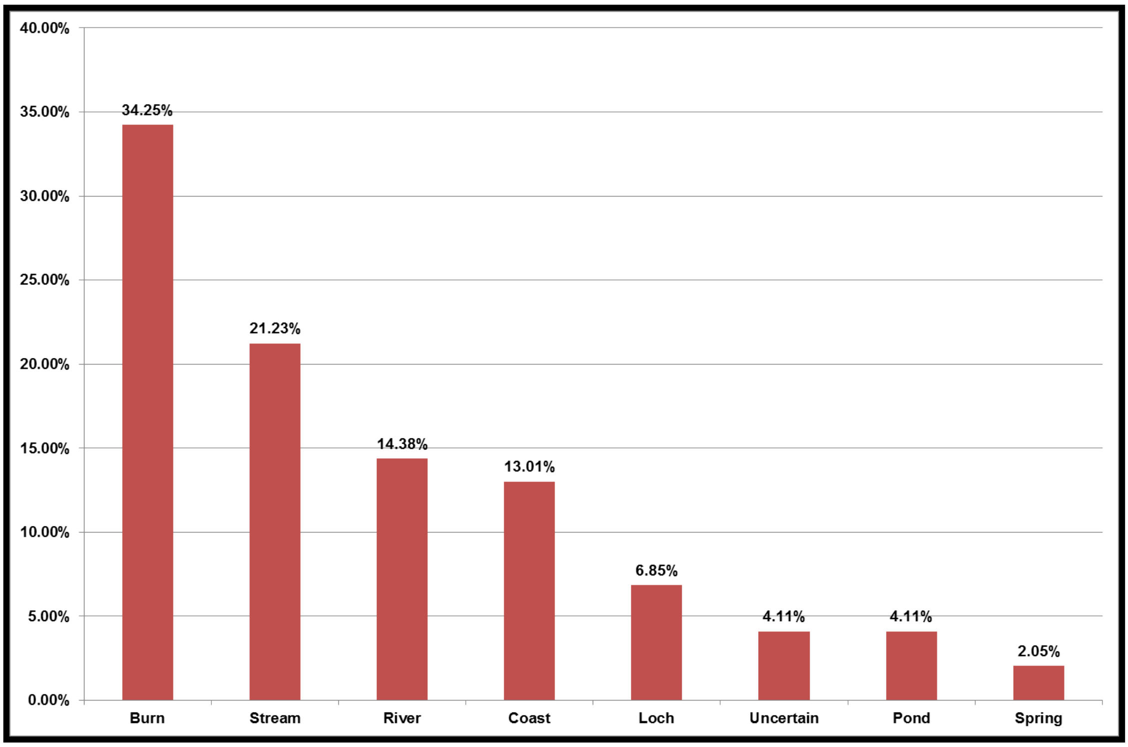
Out of the dataset for the entire Northern Mainland, only 4.12% (10) are within 25m of the shore; 6.58% (16) are within 50m; 9.47% (23) are within 100m; 16.87% (41) are within 350m, and 18.93% (46) lie within 500m of the coastline. Indeed, this means that 81.07% (197) are found outside the 500m range. Unlike in Orkney and Shetland, the coast is the nearest water body for only 16.87% (41), as seen in Figure 6.32, and so the coast was thus not a major factor of site location for many ARs here; with 26.34% (64) of the northern dataset found nearer to burns; 22.22% (54) found closer to streams, and 19.34% (47) found in closer proximity to rivers; suggesting a focus on the land, as may be expected for the Mainland.

Of course, it needs to be noted here that Caithness and Sutherland actually possess a significant proportion of the blanket bog in Britain and the area known as the ‘Flow Country’ in these two districts has been recognised as unique and is of global importance (Lindsay et al., 1988). Though bog and peat have grown around certain sites since later prehistory (as at Lairg, Sutherland; see McCullagh and Tipping 1998), modern drainage of marginal ground has also reduced many wetland areas dramatically, and hill drainage has further dried out certain marshlands. This means that the land around many ARs, once surrounded by bog and marsh, is now much drier. Indeed, man-made drainage features have made it impossible to ascertain the proximity of some sites to their nearest natural source of water, and this must be taken into consideration when reviewing these two regions. However, for a more detailed analysis, I shall examine both Caithness and Sutherland separately.

Caithness

Caithness possesses a total of 146 sites, forty-three (29.45%) are within one mile of the present shoreline, whereas sixty-one ARs (41.78%) are between one

Figure 6.34. Nearest Water Body for sites on the Caithness.

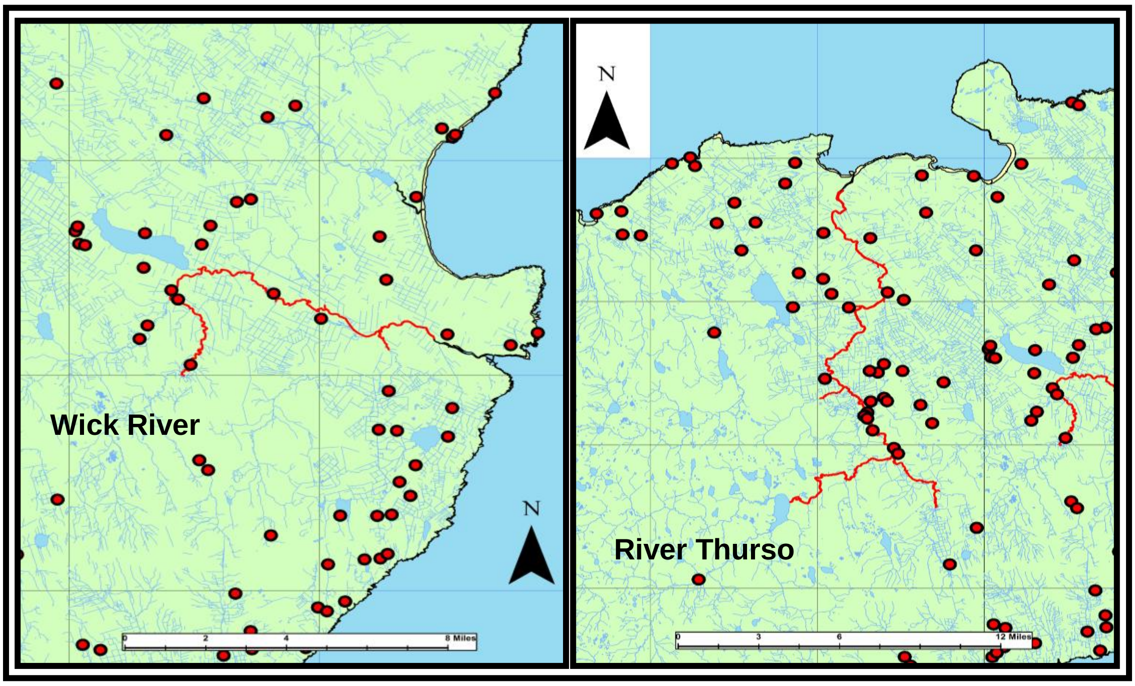


and five miles, leaving the remaining forty-two (28.77%) as inland sites. A large majority of Caithness ARs are thus located away from the shore, and out of the entire Caithness set, a mere 2.74% (4) are found within 25m; 5.48% (8) are within 50m; 6.85% (10) are found within the first 100m, and 15.07% (22) lie within 500m of the coast, with the remaining 84.93% (124) outside this range.

Though Caithness possesses an extensive coastline, only 13.01% (19) of its ARs are found closest to the shore, as seen in Figure 6.34, although 84.21% (16) of this set is within 350m of the coastline itself. The deficiency of coastal ARs here, especially when compared with the datasets of Orkney and Shetland, is probably due to the fact that Caithness has some excellent interior agricultural land, especially in the north and east of the county where we find the majority of Iron Age structures; almost all of them located within the northern 'pocket' of good land outside the reach of the boggy and peat covered 'Flow Country' (which covers much of Sutherland and parts of Caithness).

One can be fairly sure (but not certain, due to modern drainage) that forty of the fifty ARs located nearest to burns are within 350m of these water bodies; whereas twenty-one out of the thirty-one ARs located near streams are also to be found within 350m of these features, with the furthest being 650m away. With regards to those located near lochs, five out of the ten are within 100m; six are found within 500m, and the remaining four lie outside this range. For river-

Figure 6.35. Distribution of sites around the Wick River and the River Thurso. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.

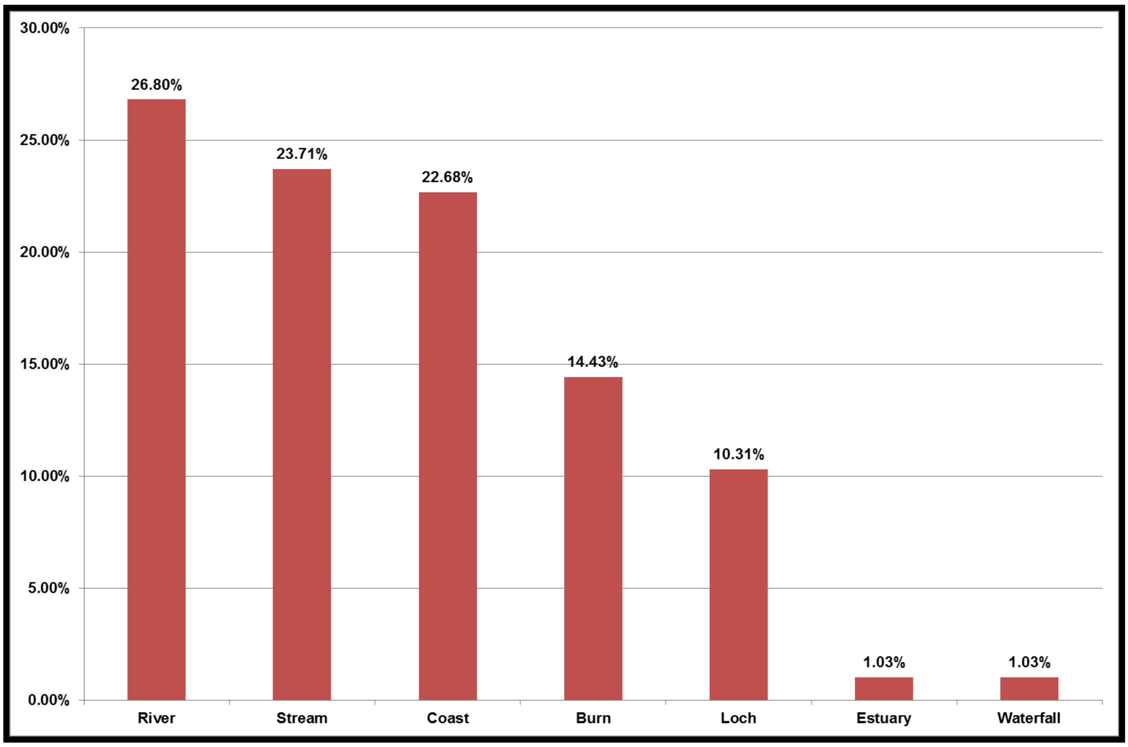


side sites (14.38% of the Caithness dataset - 21 ARs) however, close proximity seems to have been essential, with thirteen out of the twenty-one sites located within 100m of the water's edge, and nineteen found within 311m. It should also be noted that eleven of these are to be found near the River Thurso (Figure 6.35), and three others are located near the River Wick (Figure 6.35) – the two largest rivers in Caithness. This is unsurprising as the flood plains of these rivers (on which the majority of ARs are to be found) form a very fertile band of land running south-east and north-west through the county respectively, suggesting a clear attachment with good land.

Sutherland

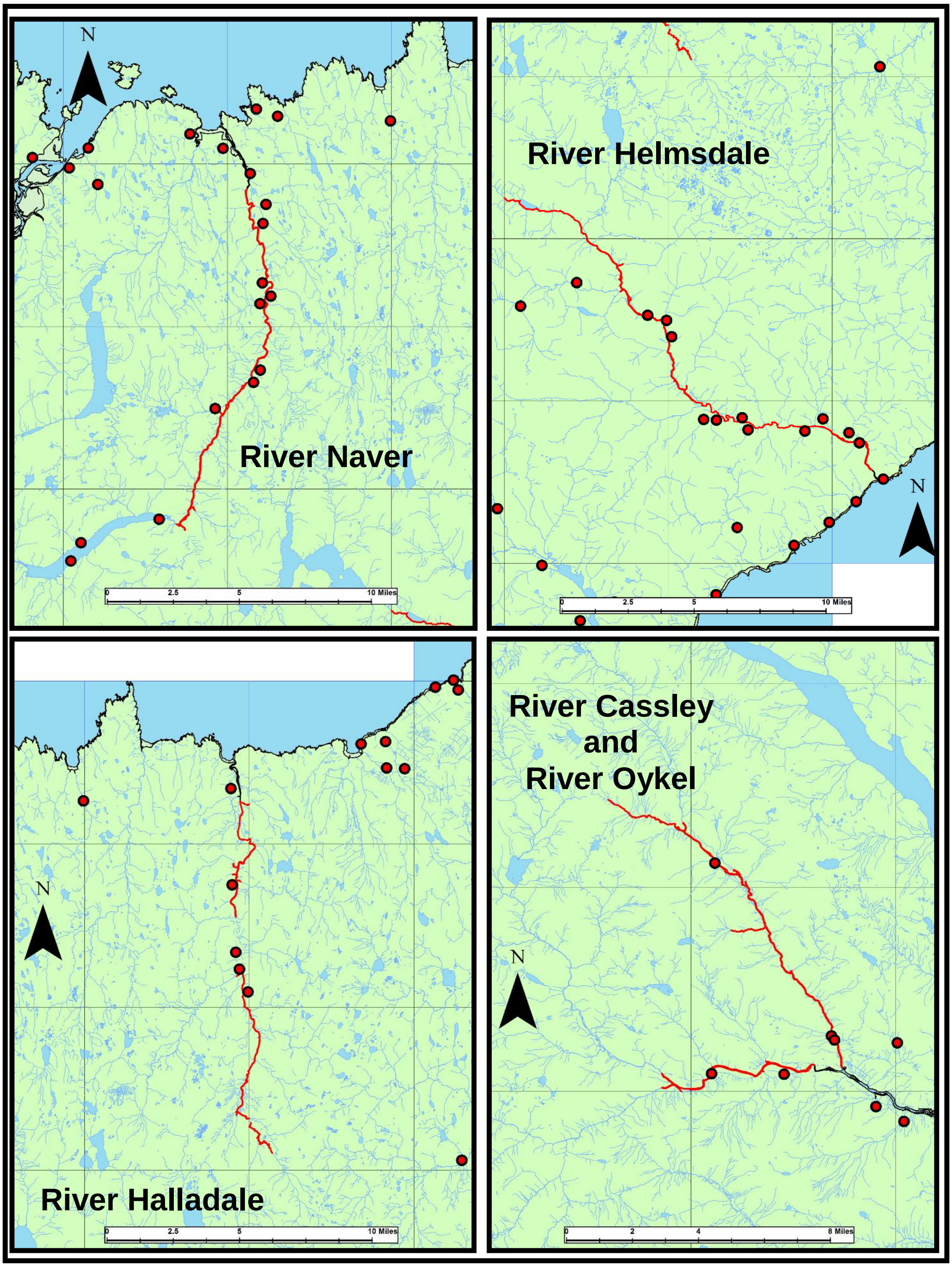
Sutherland is similar to Caithness in many ways. Out of 97 ARs, thirty-one (31.96%) are within the first mile, twenty-two (22.68%) are between one and five miles, and a large portion of forty-four ARs (45.36%) lie outside this range, as inland sites. Only 6.19% (6) are within 25m of the present coastline; 8.25% (8) are within 50m, 13.40% are within 100m, and 24.74% (24) lie within 500m – 9.67% larger than the same range in Caithness. This leaves a large portion of 75.26% (73) outside the 500m range. Indeed, the coast is the nearest water body for only 22.68% (22) of the Sutherland dataset, as seen in Figure 6.36. Many ARs here were positioned nearer to rivers, at 26.80% (26); then streams

Figure 6.36. Nearest Water Body for sites on the Sutherland.



at 23.71% (23); burns at 14.43% (14); and lochs at 10.31% (10). Indeed, rivers in Sutherland seem to have been important for the positioning of many ARs (much like Caithness; see Figure 6.37). This is unsurprising when considering

Figure 6.37. Distribution of sites around the Rivers Naver, Helmsdale, Halladale, Cassley and Oykel.



that the floodplains belonging to the rivers located within both these areas represent the most agriculturally fertile lands, and this is a factor which almost certainly inspired the construction of ARs in these places. Close proximity to rivers was thus important here, and out of the twenty-six ARs whose nearest water body is a river, sixteen are found within 100m of the riverbank, and all of them are within 340m; usually located on higher ground overlooking these water courses, as one would logically expect. Though many other ARs are located in closer proximity to tributary streams and burns which offshoot from these larger rivers, we should still consider these to have been associated with these rivers.

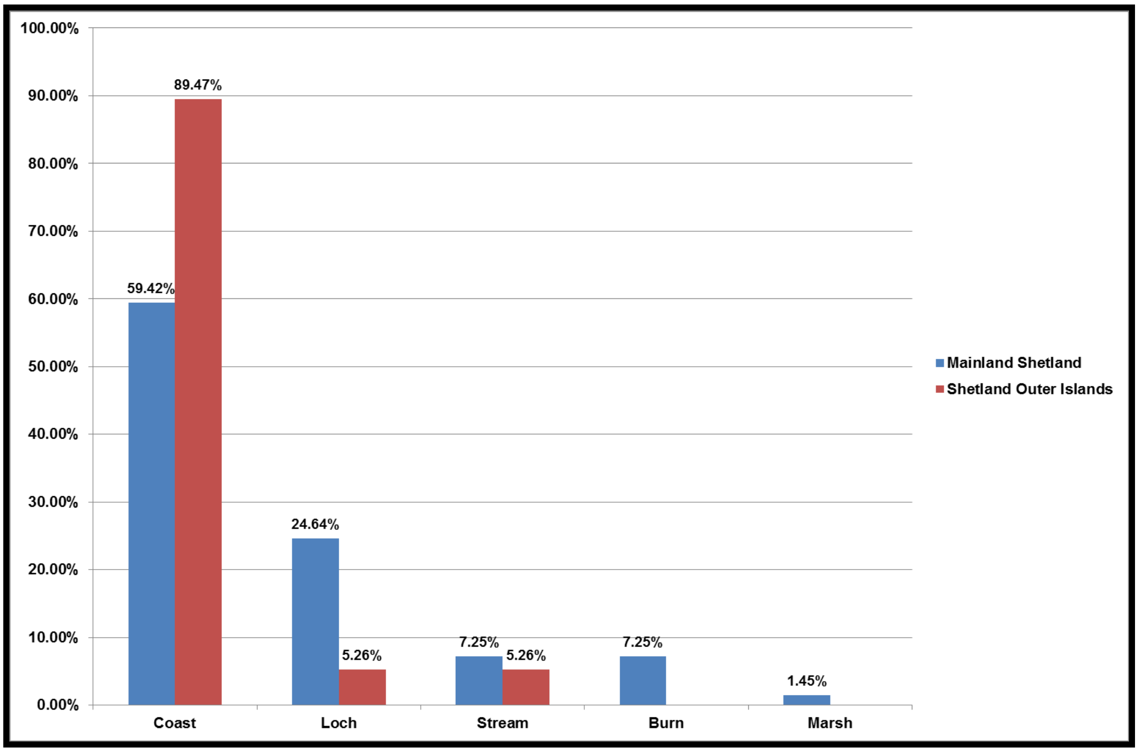
The two rivers which seem to have influenced AR location the most in Sutherland are the Naver and the Helmsdale. Also influential however were the River Cassley, Halladale River, and the River Oykel (Figure 6.37). Indeed, many ARs in Caithness and Sutherland were influenced by the flow of rivers, as well as tributary streams and burns. For the thirty-seven ARs in Sutherland which are found nearest to a stream or burn - as opposed to either the coast or a river - twenty-four are within 100m of the water body, and thirty-six are within 315m, with only one other located at a distance of 420m. Furthermore, for the ten ARs located nearest to lochs, all are within 140m of the water’s edge, and nine are within 100m.

Therefore, one can see that for the Northern Mainland, water sources were very significant when plotting an AR, and this is especially true with regards to rivers (e.g. Naver, Helmsdale, Thurso). The coast, however, was still significant in Sutherland and Caithness; however, when considering the significance of coastal positioning in the Scottish Iron Age, the Northern Islands are crucial to any investigation, and I will begin the analysis with Shetland.

The Northern Isles: Shetland

Views of the sea are almost inescapable in Shetland. Though the mainland of Shetland is fifty-five miles from north to south, from east to west it is considerably less; so much so that no part of the island is more than three miles from the shoreline (Mackie and Finlay 1933: 432). The immediacy of the sea means that coastal proximity of any AR in Shetland is almost unavoidable and out of all of Shetland’s ARs, 94.39% (101) lie within one mile of the coast.

Figure 6.38. Nearest Water Body for sites on Shetland Mainland and the Outer Shetland Islands.



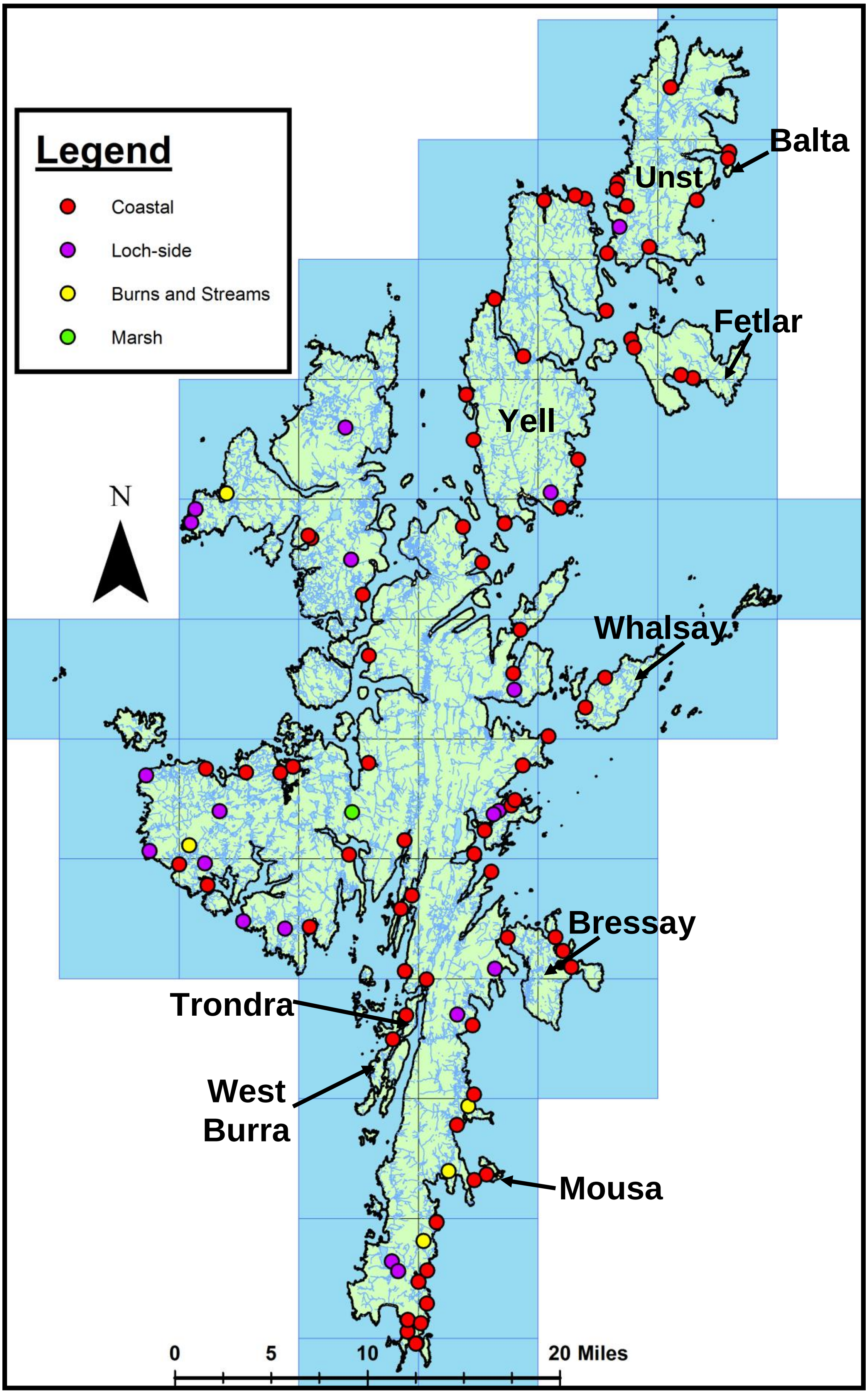
The fact that such a majority are within the first mile (out of a possible three) emphasises the significance of coastal positioning, which may not seem surprising when one considers the dominance of the sea in a place like Shetland. Indeed, coastal proximity was essential for the locating of an AR in Shetland (as marginally explored in Chapter Five), with 86.92% (93) of Shetland ARs actually being located within the first half-mile of the coast. Taking this further, 35.51% (38) are found within 25m; 50.47% (54) are within 50m; 57.94% (62) are within 100m; 75.44% (81) are within 350m; 79.44% (85) are within 500m, and the remaining 20.56% (22) lie beyond 500m. However, we must consider how other watery bodies may have influenced location, as well as making comparisons between islands, as seen in Figure 6.38.

The Shetland Outer Islands

If we exclude Mainland Shetland, and just look to the other Shetland Islands first (which possess 38 ARs overall), we find that the closest water body for 89.47% (36) is the coast itself; two others are located nearer to lochs, and another two are nearer to streams.

Out of all of the ARs on these islands, nearly half – 47.37% (18) – are within 25m of the coast, thereby standing on the shoreline itself. A large portion –

Figure 6.39. Sites on the Shetland Islands according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



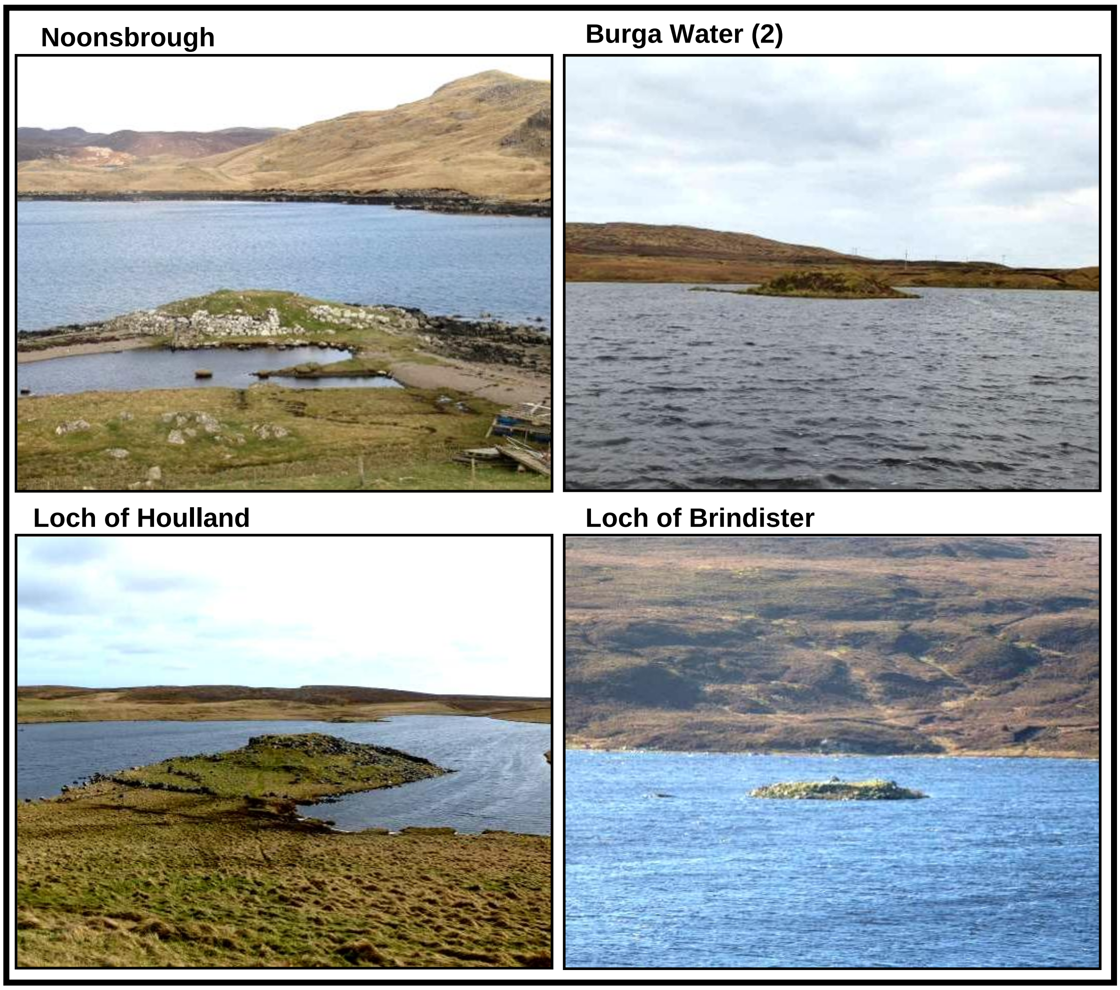
65.79% (25) – are found within 50m; 71.05% (27) within 100m; and 92.11% (35)

within 350m, with the remaining 7.89% (3) standing over 500m from the shore. We must consider that some islands are much larger than others however, and so proximity to the coast may have been unavoidable for some (see Figure 6.39). With this in mind, I wish to begin by examining the ARs located on the island of Yell, which has an area of 81.90 mil² - larger than any of the islands of Orkney (apart from Mainland). And yet, despite its large interior, eleven (91.67% of Yell's dataset) of the twelve ARs upon it have the coast as its nearest water body; with only one AR located nearer to a loch. Indeed, ten of its ARs are within 100m of the shoreline. However, it is also of note here that Yell possesses an interior dominated by peat and moorland; with its name possibly deriving from the Old Norse 'Gjall' meaning 'barren' (Haswell-Smith 2004). Indeed, its cool and wet climate, together with the non-porous nature of its bedrock, as well as the presence of boulder clay, have aided in the creation of large areas of peatland in Yell, covering over two thirds of the island itself (Nicolson 1972: 17). The most fertile land is found near to the coast, and this seems to be a likely reason why almost the entire island's dataset occur here.

In comparison to Yell, the neighbouring island of Unst, at 46.59 mil², possesses a comparably fertile and flat interior, with significant areas of peat-free land. The positioning of its ARs in relation to the sea is therefore less dominant (but still clearly coastal), with seven (77.78%) of its nine sites located nearest to the coast, with another AR nearer to a loch and one other nearer to a stream. Nevertheless, eight (88.89%) of its ARs are still within 350m of the shoreline; suggesting a strong maritime influence here.

Next, the small island of Fetlar, at 15.75 mil², is just over a third of the size of Unst, and so it is unsurprising that all of its four sites are closest to the shore, two of which are only 25m away from the water's edge; interesting considering this island's renowned fertile interior - with the name 'Fetlar' possibly meaning 'prosperous land' (Haswell-Smith 2004: 471-474) - thereby suggesting a strong connection with the sea here. Bressay, at 10.83 mil², also possesses fertile soils, and has five sites, three (60%) of which are within 25m of the shore; another two are within 350m, and one other lies outside the 500m range, and is instead located nearer a stream. The peat covered island of Whalsay, at 7.61 mil², possesses only two sites, one a mere 26m from the coast, and the other, 266m. West Burra, at 2.87 mil², has one site, 147m from the shore, and the island Trondra, at 1.06 mil², also only has one site, a mere 5m from the present shoreline. The well-known broch located on the island of Mousa, at 0.69 mil², is the only one this small tiny island possesses, and stands a mere 20m from the shore. Less than half the size of Mousa Island is Balta, at 0.31 mil², which has two ARs, both of which are less than 35m from the coast. It would thus seem that for the islanders around Mainland Shetland, the coast was certainly the primary focus for AR builders. But what of Mainland itself?

Figure 6.40. Examples of ARs in Shetland positioned in Lochs.
Author's Photos.



Shetland Mainland

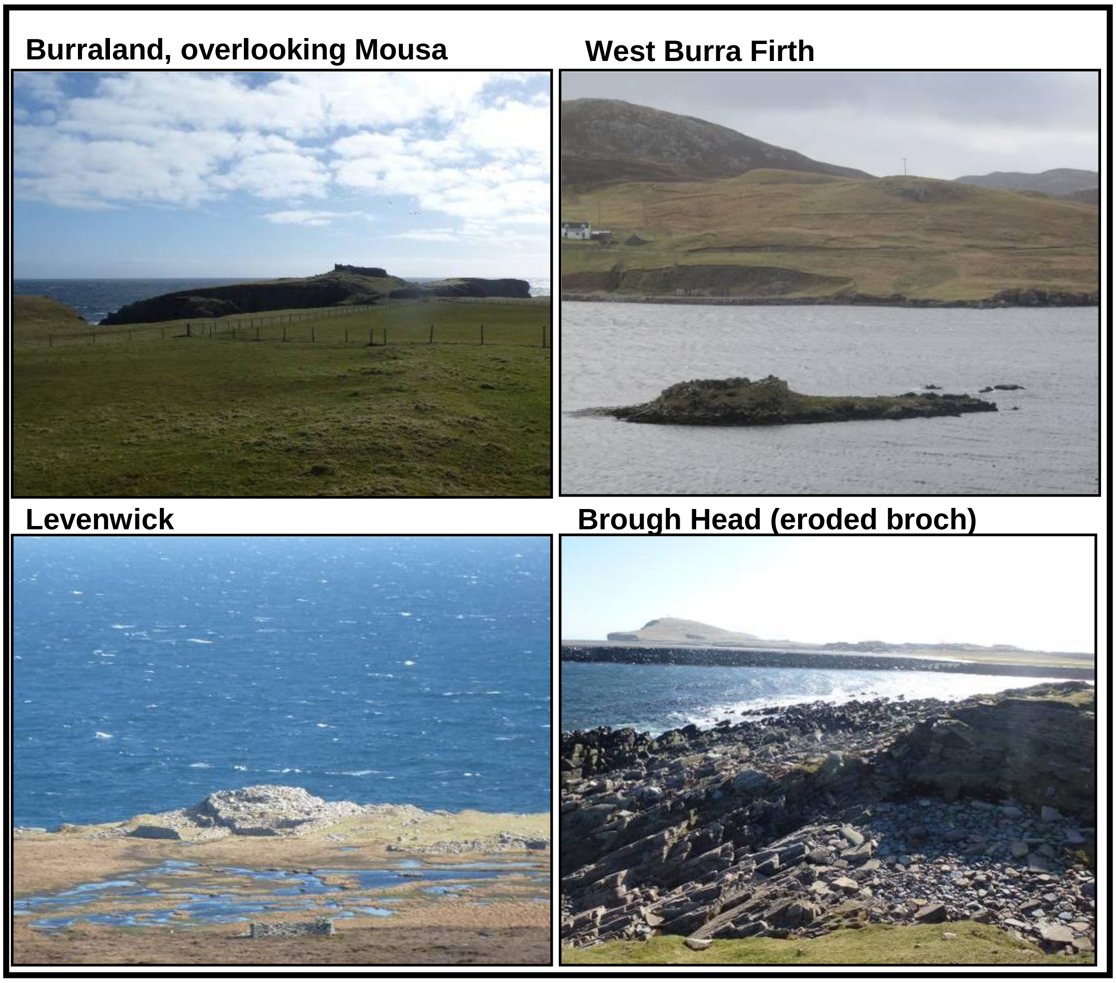
The Mainland is the largest of the Shetland Islands, and at 374.05 mil², it is the third largest island in British Isles. However, the soil of Shetland is, generally speaking, very poor (DEFRA 2006), and it would seem that many ARs here clearly avoided the peat and moor filled interior (which is also very hilly), focussing mainly on the comparably fertile coastal areas, especially those located in the south. Indeed, considering the coast, 28.99% (20) of the Mainland dataset is within only 25m; 42.03% (29) are within 50m; 50.72% (35) are within

100m; 72.46% (50) are within 500m and the remaining 27.54% (19) lie outside the 500m range. As expected then, for a large proportion, 59.72% (41) of Mainland ARs, the coast was the nearest water body; another 24.64% (17) are found nearest to lochs; 7.25% (5); nearer to burns; 7.25% (5) nearer to streams; and one other is found closest to a marsh. Considering ARs located near to burns or streams, it is notable that not one of these sites is more than 370m from these watercourses, except for Knowe of Houlland, lying 520 metres from the nearest burn. However, as noted, many ARs located over 500m away from the coast are often positioned in very close proximity to lochs instead. In fact, thirteen of the seventeen ARs whose nearest water body is a loch are positioned within only 20m of the water's edge; with many of these either being fully or at least partially located within the lochs themselves (see Figure 6.40); very reminiscent of the island ARs of the Uists. Examples include Loch of Kettlester, Roer Water, Loch of Houlland, Burga Water, Holm of Benston, Loch of Breibister, Loch of Watsness, Housa Water, Lerwick, Clickimin, Loch of Brindister, and Loch of Brow. The land around many of these lochs is often poor when compared to the reasonably fertile land located near the coast, and this, together with their unusual positioning in the landscape (often found within the lochs themselves), suggests a symbolic rather than a purely practical function; something to be explored further in the following chapter with regards to Orcadian brochs.

However, generally speaking, it would seem that the coast was the dominant aspect of most ARs in Shetland (as seen in Figure 6.41, and as is also suggested in the brief study of only twenty-three Shetland brochs in Chapter Five). Of course, the comparably fertile land located on the coast would have been an important factor when positioning the home, with some of the best land located in the southern tip of Mainland, around Sumburgh, where many ARs are to be found, including some of the most impressive which Shetland can boast of (e.g. Old Scatness, Clumlie and Jarlshof). However, what is clear when visiting these sites is that this positioning was probably not *only* due to the fertile land which is often located on the coast in Shetland (in comparison to the peat and moor filled interior at least). Indeed, it is clear that the majority of these sites sought to dominate the shoreline itself, with excellent and broad views of the sea seeming to have been of great importance to Shetland's Iron Age communities. This is demonstrated in the fact that 57.94% (62) of Shetland's ARs are located within 100m of the shore.

But coastal domination was not essential for all ARs in Shetland, with many others being located within or very close to lochs and other water sources. Again, as is implied within Figure 6.40, though this may relate to the fertile land around some of these lochs, it equally suggests a connection between water and the broch, as to be explored further in Chapter Seven.

Figure 6.41. Examples of ARs in Shetland which overlook the sea.
Author's Photos.

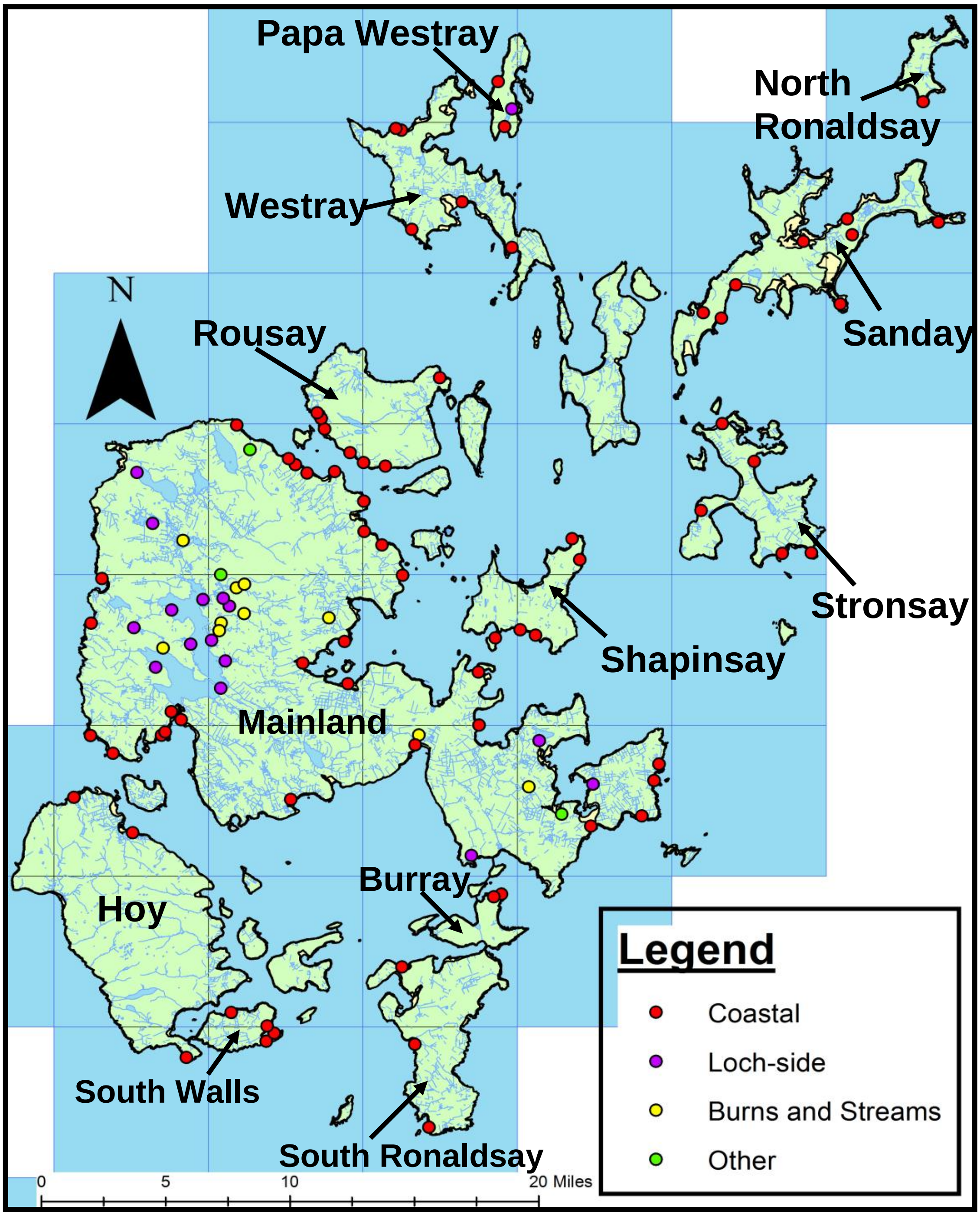


The Northern Isles: The Orkney Islands

As seen in Figure 6.42, the Iron Age Orcadian affinity for the coast is obvious as 89 of the total 103 Orcadian ARs are located within a mile of the shoreline (86.41% of the entire Orkney dataset). As an island set, it may seem unsurprising that so many brochs are positioned within a mile of the shore.

But upon closer examination, proximity to the coastline itself appears essential. Out of all the ARs located within a mile of the present coastline, sixty-six of the eight-nine (74.16% of that set) are found within 100m of the shore. As the first hundred metres of a mile only make up 6.2% of the total distance of a mile, then it is clear that the majority of Orkney ARs were positioned not only with coastal

Figure 6.42. ARs on the Orkney Islands according to their nearest water body. © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.

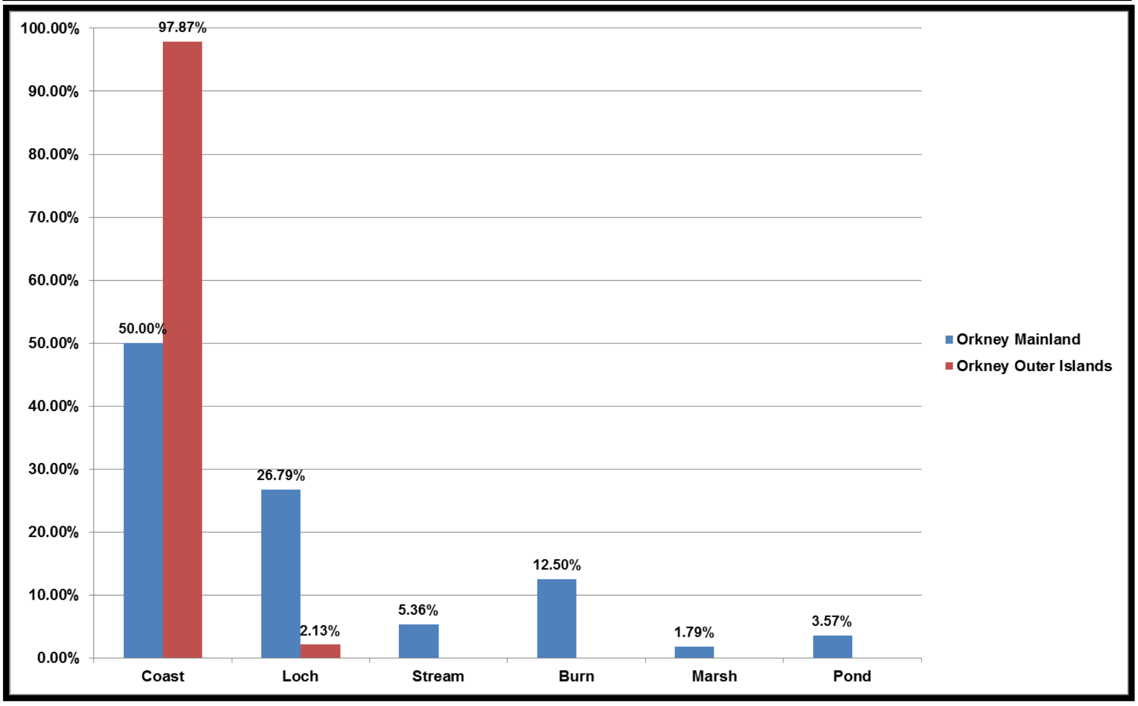


proximity, but coastal domination in mind and would have literally towered over the actual shorelines on which they were situated.

Out of all of Orkney's ARs, 40.78% (42) are found within only 25m of the shore; 60.19% (62) within 50m; and 64.08% (66) within 100m; 70.87% (73) within

350m, and 73.79% within 500m (76) of the coast. Of particular note here is the fact that 64.08% (66) of Orkney's dataset lies within 100m of the present coastline. This is more than two thirds of the Orkney dataset, and represents a difference of 6.14% more than the dataset of Shetland (which was 57.94%). This may not seem like much of a difference, but it is notable that there is no part of Shetland which is more than three miles from the shoreline (Mackie and Finlay 1933: 432), and this means that coastal proximity in Shetland is a practical inevitability. The shape of Orkney Mainland however means that the coast is never more than five to six miles away, thereby resulting in the possibility of more interior sites. However, we still find a majority of Orkney ARs within the 100m shoreline zone (64.08% - 66 sites), in comparison to the 57.94% of those ARs in Shetland within the same range. Compare this to the ARs located on Scotland's other largest islands and one finds that Orkney still dominates. Out of all the ARs on Skye, 40.91% (36) of these are positioned within the first 100m; for North Uist it is 15.85% (13); for South Uist, it is a much

Figure 6.43. Nearest Water Body for ARs on Orkney Mainland and the Outer Orkney Islands .



lower 2.94% (2); for Mull it is 33.33% (12), for Islay, it is 30.61% (15) and for Lewis and Harris (the largest of Scotland's islands), it is 44.74% (17).

It is therefore obvious that for Iron Age Orcadians, coastal positioning was of paramount concern. In fact, Orcadian ARs are so predominantly coastal that more than half of its 103 sites are located less than 50m from the shoreline, making up a total of 60.19% (62). When comparing this to sites from Shetland found within 50m (50.47%), the difference between the percentages may seem somewhat marginal at 9.72%. But when we compare both the sets from these islands to the set of Argyll and Bute (9.89% of its ARs are within 50m of the shore), it demonstrates that ARs in the Northern Isles favoured positions of coastal command rather than inland or even loch-side positions. This is perhaps partly due to the fertile soils often found near the coast, as well as the excellent – and easily accessible – building stone found near the shore in many areas of Orkney (e.g. the Old Red Sandstone at Yesnaby).

The Orcadian Islands

Like in the analysis of Shetland, if we first exclude Mainland Orkney (the largest island of the set), and look to the other Orcadian islands (which possess 47 ARs overall), we find an overwhelming focus on the coast. The closest water body for 97.87% (46) of these ARs is the coast itself, as seen in Figure 6.43. In fact, only one site is located closer to another source - the loch side broch of St Tredwell's Chapel on Papa Westray. This AR stands nearly 500m away from the coastline, but it is a site which actually extends into the Loch of Tredwell itself and is thus surrounded by water on all but one of its sides.

Out of all the ARs on these islands, nearly half – 48.94% (23) – are within 25m of the coast, and therefore literally stand on the coastline itself. A majority, at 80.85% (38), are found within 50m; 87.23% (41) are within 100m; and 93.62% (44) are within 350m. The coast was thus the overriding feature of attention for these islanders. However, we must also consider that some islands are much larger than others, and so a proximity to the coast may have been unavoidable for some. With this in mind, I wish to examine the ARs located on the island of Hoy, which has an area of 55.21 mil². Hoy represents the largest of the Orcadian islands, except for Mainland (201.93 mil²), and has one of the largest interiors available. All three of its sites are located within 50m from the shore however, and one can assume that this must be due to the fact that Hoy possesses an extremely difficult and mountainous interior of moorland.

Sanday possesses a much more fertile and low-lying landscape however, and with an area of 19.31 mil², it is just over a third of the size of Hoy, with four of its eight ARs located within 25m of the coast, and six within 100m. The three sites on South Ronaldsay, which is roughly the same size as Sanday (with an area of

19.30 mil²), are all found within 100m of the coast. The island of Rousay, with an area of 18.92 mil², has a hilly, moorland interior, but possesses reasonably fertile land nearer the coast, and so it is unsurprising that all eight of its ARs are located within 60m of the shoreline – seven of which overlook the dangerous waters of Eynhallow Sound.

The slightly smaller island of Westray, with an area of 18.5 mil², is renowned for its fertile landscape (Haswell-Smith 2004), and yet, despite its fertile interior, all five of its ARs are within 100m of the coastline; suggesting, again, a strong connection to the sea here. Stronsay (12.74 mil²) and Shapinsay (11.4 mil²) however, though comparatively smaller than the above islands, both possess five sites within 350m of the coast. South Walls, being much smaller at 4.24 mil², has four sites, and all are within 100m of the coast. Though Papa Westray, at 3.54 mil², is one of the remotest and smallest Orcadian islands, it also possesses some of the best land available; with the island predominantly being made up of fertile soils derived from drift deposits overlying the Old Red Sandstone and interspersed with shell sand (Lamb 1995: 16; Lowe 1998: 1; Rendall 2002: 33). It has three ARs, two of which are located within 50m of the shore, and one oddly located within Loch Tredwell, nearly 500m from the coastline. Burray, with an area of 3.48 mil², has two sites, both of which are within 100m of the shore; and North Ronaldsay, with an area of only 2.7 mil², has one AR – Burrian – which is a mere 20m from the coast, overlooking particularly hazardous waters; interesting when one considers that the soil of this island is regarded as fertile and could assumingly support multiple ARs.

Taking all this into consideration, it is obvious that the coastline was most definitely the focus of attention for AR builders on these islands; and this is especially true for those islands where the coast held the most fertile land (e.g. Rousay).

Mainland Orkney

Orkney Mainland is the largest of the Orcadian islands, and possesses an area of 201.93 mil² – 146 mil² larger than its nearest counterpart, Hoy. With such a large interior (and with much of its land being reasonably fertile), it is unsurprising that although the closest water body for 97.87% (46) of the outer island ARs is the coast, only 50% (28) of the Mainland ARs have the coast as their nearest water body. Despite its size however, a large proportion of

Mainland ARs are still in very close proximity to the coast, with 33.93% (19) of the Mainland dataset within 25m; 42.86% (24) within 50m; 44.64% (25) within 100m; 51.79% (29) within 350m; and 53.57% (30) found within 500m of the shoreline; thereby, altogether, constituting a general proximity which seems reasonable considering the fertility of the soil on Orkney's coastal slopes.

The other most significant water body on Mainland is the loch. Indeed, though half the dataset has the coast as its nearest water body, over a quarter (26.79% - 15 ARs) are in closer proximity to a loch, many of which are positioned near to the sea lochs of Harray and Stenness (thereby theoretically constituting both inland and coastal sites at the same time), as can be discerned in Figure 6.43. This distribution could be expected however as the basin around these lochs possesses very fertile soils; something which contrasts markedly with the rolling hills of moorland which surrounds them, and which, as a result of this infertility, possess no ARs at all.

Figure 6.44. Harray Churchyard Broch. View towards nearest water body – Loch of Bosquoy; with Loch of Harray in the distance. *Author's Photo.*

Interestingly, out of the fifteen ARs which can be regarded as loch-side sites, ten (66.6%) are within 15m of the water's edge, with thirteen (86.67%) are within 150m. Two others are outside this range – Knowe of Skogar and Harray Churchyard. Though the Knowe of Skogar broch is 320m from its nearest loch,

Loch of Isbister, we could still regard it as close to this particular body of water. The broch at Harray Churchyard however stands at a distance of 566m from its nearest water body – the Loch of Bosquoy. Indeed, the distance between this broch and this loch represents the furthest distance of any AR from its nearest water source on all of the Orkney Islands. However, this distance is closer than perhaps imagined, and would probably have represented a mere five minute walk. As seen in Figure 6.44, Harray Churchyard is positioned on a knoll and overlooks the surrounding plain. It thereby has a commanding view of the Loch of Bosquoy, and has further views towards the Loch of Harray, and even the Loch of Stenness. Many other ARs on Orkney are similar.

Figure 6.45. Howen Brough. View towards Loch of Harray. *Author's Photo.*

The remaining 23.21% (13) of Mainland Orkney's ARs are found in close proximity to other water bodies – streams, burns, ponds, marshes. Many of these are positioned right next to these features however, such as Burrian at Corrigall, situated a mere 8m from a burn. Another, Manse of Harray, is located 33m from a burn, and also possesses two well-like features, one of which was positioned outside the entrance and was supposedly connected to its nearby burn by a drain – an interesting feature to be explored in the subsequent chapter. Howen Brough is another AR located just 15m from a burn, having the further advantage of overlooking the Loch of Harray (Figure 6.45), which, as this loch is connected to the sea, was probably a waterway of great significance in

Figure 6.46. North Bigging Broch. View towards Loch of Harray in the distance. *Author's Photo.*

the Iron Age. Others, though located near streams and burns – such as at Toft's Farm and Campston – are practically situated on the coast itself and possess excellent views of the shore from their elevated positions.

Many other ARs may not seem to have had such close proximity to water bodies. However, given the attention water bodies seemed to have generally received in Orkney, it would be a mistake to believe such concerns were overlooked. For example, North Bigging, though 500m from the nearest stream, stands on high ground, and this permits it to have excellent views over the Loch of Bosquoy and the Loch of Harray (Figure 6.46). Indeed, this position would have granted this site extensive views that ARs located on the loch itself would not have enjoyed. Indeed, any boat travelling down these waterways would have doubtless seen this site. Knowe of Gullow, located 276m from a burn, is likewise positioned on high ground and also overlooks the Loch of Harray (Figure 6.47); as does the Knowe of Burrian, which appears to be situated on flat land, but is actually only 150m from the nearest burn and overlooks the Loch of Harray too.

Overall then, watery contexts of all kinds were sought in Orkney and seem to have been a major focus of attention for the islanders in general. Obviously however, as was briefly explored in Chapter Five, the coast was very significant in Orkney, especially for its ARs located on its outer islands. Indeed, it is clear that the majority of Orkney's ARs were closely connected to the sea and that their builders intended these structures to be observed not from the land, but

Figure 6.47. Knowe of Gullow Broch. View towards Loch of Harray in the distance. *Author's Photo.*

especially from the coastal perspective. This can especially be seen in the ten ARs (Gurness, Costa Hill, Vinquin, Broch of Burgar, Knowe of Grugar, Knowe of Stenso, Tingwall, Hall of Rendall, Knowe of Dishero, and Wass Wick) which face out from the northern coast of Orkney and into Eynhallow Sound, as shall be explored in the next chapter. However, though this clustering here could at first glance be explained by the fact that the soils of North-West Orkney are considered to the most fertile on Mainland (Ritchie 1979: 174), the strong connection which these brochs seem to have had with the sea - and their often stark profile on the horizon when seen from the sea - suggests that these were more than just well-situated farms, and were being symbolically tied to the waters they overlooked.

Conclusion: Aquatic Cultures or Just Well-Placed Farms?

So what conclusions may one draw from the above analysis? What is obvious is that ARs across Atlantic Scotland, especially those located in Orkney, Shetland and the Uists, had clear and strong associations with watery contexts, especially with the sea, lochs, rivers, streams and burns. For these aquatic communities, one can imagine that the watery contexts which they were positioned close to would have had great practical value (cf. Rennell 2010), acting as: (1) a source of food and fresh water (e.g. lochs, streams, rivers); (2) as a vital means of transportation (e.g. rivers, coast, lochs); and (3) as places where the dead may have even been deposited (see: Bradley and Gordon 1988; Chamberlain 2003; Evans 2013; Marsh and West 1981).

Above all else however, the fertile land which is often located within the vicinity of water sources (especially rivers and the sea) would have been of great importance; and this can be observed throughout the analysis above. Indeed, many of the islands of Atlantic Scotland possess interiors of very poor land (e.g. Mull, Lewis, Hoy), and the ARs within these areas tended to be positioned on the coast where the best land can often be found. Likewise, the commonality of riverside ARs within Caithness and Sutherland (especially those on the rivers Helmsdale, Thurso, Wick, and Halladale) are often located on high ground overlooking the fertile floodplains which border these watercourses; thereby strongly suggesting that these sites had a key role in maintaining these lands.

However, the reasoning behind the positioning of the domestic space is seldom so simple, and with water being so abundant in the Scottish landscape, meaningful attachments would have doubtless been given to this element by Iron Age communities. Indeed, as seen above, some ARs in Atlantic Scotland had such a close relationship with water (most clearly seen in Shetland, the Uists and Orkney) that it seems clear that this element was being given great significance. Therefore, I would argue that although fertile land was probably - and logically - sought, one also needs to bear in mind that the connection to water in these landscapes is sometimes so strong that explanations other than just good land need to be explored.

The ‘crannogs’, for example, referring to any artificial island assumed to hold a domestic dwelling (Barber and Crone 1993: 520), are traditionally regarded as defensive refuges (Warner 1994; O’Sullivan 1998; 2000), and this is equally true with regards to the island ARs which we find across Atlantic Scotland (refer back to Figures 6.12 and 6.40), especially in the Uists. However, O'Sullivan’s (2009) research highlights how rich in meaning crannogs - and by extension, island ARs - may have been. Defined by the water which surrounds them, these sites uniquely intertwine complex and evocative ideas of ‘islandness’, liminality and boundedness; all of which create a powerful sense of place in the water (also see: Cavers 2006; Henderson 2009; Rennell 2010).

Indeed, although the defensive practicality of positioning the domestic space within lochs may seem obvious to us (perhaps again prompted by the familiar image of the Medieval castle and its water-filled moat), these were not convenient locations for any dwelling, and the introduction of these man-made inhabited structures into reflective watery settings would have required a significant – and a somewhat conspicuous – investment of labour in their construction. This further suggests then that water was a special element in Iron Age Scotland, as it still is, experienced in various ways and possessing multiple and potentially contrasting meanings, with different water bodies perhaps carrying multiple connotations (see: Cunliffe 1997: 194; MacCulloch 1911: 181; Megaw and Simpson 1979: 405). Instead of water being something peripheral then, it may have actually been rather central to the identity of Iron Age communities in Atlantic Scotland; and no where may this have been more pertinent than in Orkney, which acts as the focus of attention for the final chapter of this thesis.

As explored in Chapter Five, good light was necessary for the locating of many Orcadian brochs. Likewise however, as has been examined here, good land also seems to have been essential in Orkney, as is suggested in the positioning of ARs not only on the fertile coastal slopes, but also along the sea lochs of Harray and Stenness. Orcadian brochs were thus very much integrated into their environment; an environment where the polarities of light and water were extreme. For this reason, and as shall become clear, Orkney represents an ideal case study with regards to studying how the meanings given to both water and light intertwined in the Iron Age. Indeed, there are many reasons to select Orkney for this study, including: (1) the large number of existing Iron Age sites;

(2) the excellent state of preservation of those sites; (3) the long and extensive history of archaeological excavation here (something which contrasts with many of the areas noted above; e.g. Argyll, Caithness); (4) the perilous nature of the waters which surrounds and links the Orcadian islands (e.g. the Pentland Firth; Hoy Sound; Eynhallow Sound); (5) the seasonal effects (especially relating to light availability) of the island's high latitude; (6) the existence of a large number of underground 'wells' beneath the floors of many Orcadian brochs; and (7) the existence of unique and dark enigmatic underground chambers on Orkney (and which often hold water), such as Mine Howe and Knowe of Skae. For these reasons and more, Orkney promises a rich investigation into the ways in which light and water influenced Iron Age society.

Chapter Seven

Appeasing the Waters: The Relationship between Water, Light and Darkness in Iron Age Orkney

Introduction: Moving Forward

As explored within Chapter Six, water was very present within the domestic landscapes of the Atlantic Scottish Iron Age, with the house often being located on the periphery of natural water sources. However, we should be aware that the creation of such a general – almost nation-wide – picture may lead us to make assumptions across large areas. Indeed, broad generalisations often allow the subtle message to be missed, and in many ways, such approaches can often misguide the viewer to either overlook or underestimate the complexities which lie behind the record. This is a problem which especially underscores purely map-based or GIS methodologies.

GIS can, of course, be a versatile tool when it comes to the study of landscapes (Allen, Green and Zubrow 1990; Gillings and Mattingly 1999), with one of its main advantages being that it allows researchers to test hypotheses relatively quickly and establish spatial statistical significance (e.g. Armstrong, Hauser, Knight and Lenik 2009; Swanson 2003). However, the theoretical stance once upheld by GIS is increasingly being challenged (e.g. Gillings and Wheatley 2001; Hu 2012; Wheatley 1993; Witcher 1999), and questions have been raised as to whether GIS inspired models represent substitute realities or pure simulacra (see Baudrillard 1994). GIS – and map-based research in general – can have a tendency to not only reduce place and space to location and distance, but can also emphasise the physical aspects of landscape over cultural and cognitive perspectives (Lock and Harris 1997; 2000). This represents more than a mere oversight however, as the emphasis on physicality can sometimes influence the interpretation of the data itself.

Indeed, maps – used in conjunction with GIS – should not be considered as neutral tools (Chisman 1999: 182) as they foster a particular view on the world; categorising, partitioning and locating space in a way that is very characteristic of a Western, post-Enlightenment and scientific viewpoint. As Thomas (2004b: 199) argues, such Euclidean conceptions of space – as something rectilinear, isotropic, gridded and framed – establishes the conditions for dispassionate observation (i.e. the scientific gaze), and the use of maps can often influence the user to perceive things within that restricted gaze (cf. Bender 1998). Map-based research thus captures a view of reality which can be heavily biased towards a scientific data-driven representation, thereby sometimes denying or overlooking more qualitative interpretations of the record which are essential if one is to interpret the nature of society in the past.

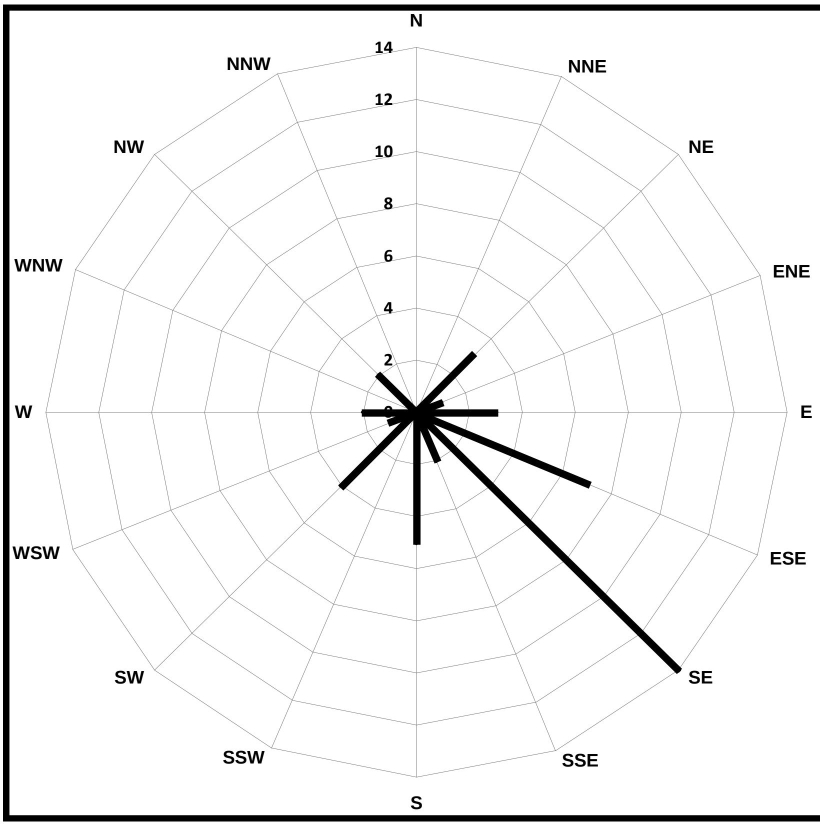
For example, the map-based analysis of Chapter Five clearly demonstrates a general desire for direct sunlight within the brochs of Orkney and Shetland, and likewise, the map-based analysis of Chapter Six depicts a broad domestic proximity to water throughout Atlantic Scotland, depending on region and type of water body. The approach of both chapters are enlightening with regards to determining domestic positioning within the landscape (at least the landscape as seen from a map-based perspective), but the distant and dispassionate gaze that a purely map-based approach can sometimes (though not always) foster may lead us to interpret the need for light and the proximity to water in purely practical terms (Gaffney, Stancic and Watson 1995: 211); at least when used on their own, and without first-hand observations, that is.

As archaeologists (and anthropologists) are increasingly seeing 'landscape' (and 'place') as something socially constructed, subjectively experienced and polysemic in nature[13], it is more important than ever that we use map-based approaches in conjunction with more experiential (i.e. attaining the human, experience-based perspective) approaches to the archaeological record and the landscape. Such methods have been popular in Neolithic and Bronze Age studies (e.g. Bender, Hamilton and Tilley 1997; Hamilton and Whitehouse 2006; 2007; Watson 2004; Whittle 2004), but not so much in Scottish Iron Age research (cf. Rennell 2008; 2010: 47).

I thus wish to begin by arguing that the domestic relationship with both water and light in the landscapes of Atlantic Scotland is more than meets the eye, and one should not regard the close relationship which communities had with both these elements as a practical matter alone, as this would certainly miss the powerful cultural symbolism which was doubtless being invested in these

[13] For various examples, see: Bachelard 1994; Bender 1993: 3; 2002; Bender, Hamilton and Tilley 1997; Bender and Winer 2001; Boaz and Uleberg 1995: 252; Cosgrove 1984; Cosgrove and Daniels 1988; Green 1990: 358; Groth and Wilson 2003; Hirsch 1995; Ingold 1993; Keith and Pile 1993; Malpas 1999; Morris 2011; Relph 1976; Thomas 1991; 2001; Tilley 1994; 2008a; 2008b; Tuan 1977.

Figure 7.1. Orientation Pattern of Orkney's Neolithic Cairns.
(Data attained from Canmore, within the Royal Commission on Ancient and Historical Monuments of Scotland database inventories).



Cardinal Point	No. of Sites
N	0
NNE	0
NE	3
ENE	1
E	3
ESE	7
SE	14
SSE	2
S	5
SSW	0
SW	4
WSW	1
W	2
WNW	0
NW	2
NNW	0

elements. But if the subtle symbolism attributed to both light and water are to be observed (instead of overlooked), it is important to narrow our focus onto one region so as to avoid any broad overviews. As suggested at the end of Chapter Six, Orkney represents an ideal case study.

As noted, in Orkney's northern latitudes, there exists a marked contrast between the eighteen hours of sunshine at midsummer and eighteen hours of darkness at midwinter. The benefits and hardships presented by the great polarities in the nature of light in Orkney would have thus been more pronounced than in southern regions of Britain, and this is likely to have granted light (and darkness) a particular significance in Orkney. Light, after all, strongly influenced Orkney's Neolithic communities, with many of their chambered cairns being focussed towards the sun of the winter solstice (Figure 7.1; also see Hedges 1984: 160; Wickham-Jones 2012: 47); very much akin to the orientation pattern of Orkney's brochs. Indeed, the existence of a 'light-box' within the Crantit cairn is especially relevant with regards to light's importance in these latitudes (Ballin-Smith 1999; Ballin-Smith, Duncan and Richards 1998).

However, though light is certainly a pertinent theme here, Orkney – surrounded by dangerous seas – represents a particularly unique area of study with regards watery meaning too. With its Iron Age brochs located near and sometimes even within aquatic contexts (as explored within Chapter Six), water, rather than something peripheral, is likely to have been central to the identity of Orkney's Iron Age population. And, as light generally acts as an analogical tool (as explored in Chapter One), its symbolism is therefore likely to have tied in with the meanings granted to water. Indeed, the discovery of enigmatic underground and intentionally dimly-lit structures such as Mine Howe on Orkney, with its watery cistern, together with the existence of dark subterranean wells beneath many brochs on these islands, suggests that water not only acted as a significant social medium, but that its significance was indeed entwined with that of light (and especially the idea of darkness).

But before examining the significance of these elements in Orkney, I wish to briefly ask how (and why) water itself inspires meaning in the first instance.

Seeking the Hidden World of Watery Meaning

In anthropology, with the studied populace being both present and informative, the ways that elements in the environment can construct social meaning can be witnessed and recorded, and it is a theme that has previously underlined work on cross-cultural aesthetics; including Gell's (1992a) analysis of the visual effects of Trobriand canoes, and especially Morphy's (1989; 1991; 1992; 1993) observations on the way that ideas of 'shine' or 'brilliance' can be an emanation of regenerative forces in some very different cultural settings. The archaeologist obviously has a greater challenge, as the often subtle meanings granted to certain elements have long since vanished. For Scotland however, the sometimes harsh climate of its northern latitudes foregrounds certain stimuli above others, and as this is especially pertinent with regards to water, we can speculate that its importance was rather central to the identity of its Iron Age communities, as it remains so today (Cohen 1987; Miller 1999; Waugh 1960).

As already suggested in the previous chapter, water is inescapably not only a substance of individual physical survival, but is also the substance of all production and reproduction. It is unsurprising then that like the prominence given to 'brilliance' as stated in the Chapter One, hydrolatry (water worship of one sort or another) occurs in every cultural and temporal context, and even in the most secular cosmologies, water is presented as the fundamental source of life. Water's diversity also makes it significant as a symbol, and it is no wonder that water's fundamental and changeable nature means that it is consistently encoded with intensely powerful symbolic themes of meaning (Giblett 1976; Illich 1986; Strang 2004), and these resurface in different forms in every cultural context.

As noted at the beginning of Chapter Six, water and light share a very close relationship; a fact which instigated this analysis on water. In the modern world however, it is all too easy to forget how untameable light and water can be together. Indeed, water, even at its calmest, reflects the most subtle changes in light, and shimmers with movement; only aiding to demonstrate how its transformation never seems to cease – water is always undergoing change, movement and progress, and it is this ability to reflect and scatter light which also makes it a very visually compelling element. As Strang (2005: 101) explains, light provides water with its 'hypnotic' quality, as well as its ability to induce powerfully affective responses. But the light bearing qualities of water also emphasises the fact that until relatively recently in human history, water was the only 'mirror' and provided the only opportunity to see a visual image of oneself, and thereby allow a person to witness themselves reflexively. It is therefore not surprising to find recurrent cosmological ideas in which water is believed to hold the 'image' or 'spirit' of the person. Indeed, thousands of wells in Britain have long histories as containers of deities, spiritual forces, ghosts and supernatural powers (Bord and Bord 1985; Varner 2009), as shall be explored below. But when investigating the significance of water, and its light reflecting qualities, within Iron Age Orcadian society, I wish to also consider how water is not just a visual element, but multisensory.

Sensory faculties may be accorded significantly different priorities within different cultural contexts (Howes 1991; 2003; Stoller 1989) and may thus be given multiple interpretations. Vision is not the only method in which to experience water. Previously, Bender (1998) has argued that there is a greater emphasis placed on vision in western societies, and this influences the interpretation of cultural evidence throughout the humanities (cf. Classen, Howes and Synnott 1994: 88-92; Jay 1993). Indeed, without informants, archaeology is extremely vulnerable to interpretation in the western mindset and the visual assumptions towards material culture (and the environment) that that entails. Even within the academic disciplines that possess informants, as in anthropology, this is a pressing point (e.g. Classen 1990; 1993a; 1993b; 1997; Howes 1991; Ong 1982; Stoller 1989).

But sensory anthropology is gaining influence; Feld (1982), for example, has argued that there tends to be a prioritization of sound in forest dwelling groups rather than vision (cf. Carles, Bernáldez and De Lucio 1992; Carles, López Barrio and De Lucio 1999; Dyrssen 1998; Hellström 1998; Peek 1994). Another good example, as given by Classen (1997: 403), regards Navajo sand-paintings, which are much more than just visual representations for the Navajo; they are in fact part of the context of healing ceremonies and are made to be pressed onto the bodies of patients – they are not simply seen, but felt. So too, the oral culture of the Hopi of Arizona places an emphasis on sensations of vibration above others, while that of the Desana of Colombia highlights the symbolic importance of colour (Classen 1993a; Reichel-Dolmatoff 1978).

In the same regard, the significance that Iron Age Orcadian society may have attached to the element of water may be more than first assumed (as suggested in the introduction to this chapter). Like in the studies noted above, environmental stimuli, such as water, can be experienced in multiple ways; by sight, by touch and by sound. For example, one of the most compelling sensory experiences of water is that of immersion, which can be either fearful or highly pleasurable.

Differing emotive responses can also be attached to the audible stimuli of water, and in the minds of past societies these may have been more prominent than visual or physical experience. These audible experiences need not be singular either; the sound of a waterfall can instigate excitement or terror, whereas the soft and lulling sound of a brook can be relaxing, meditative and hypnotic. The nature of waterbodies within the landscape can also change the acoustic qualities of a place; creating differing emotive responses in the process. Rennell (2010: 57), for example, examining the acoustic qualities of ‘island duns’ in the Outer Hebrides, interestingly states that the local topography (which is usually a basin) causes sound to be restricted upon many island duns, and that this is able to create a strong sense of enclosure and isolation[14]; something which I too experienced when visiting island brochs in Orkney and Shetland (e.g. Loch of Houlland, Shetland).

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[14] For similar studies on the acoustic properties of archaeological sites, see: Devereux and Jahn 1996; Goldhahn 2002; Watson 2006; Watson and Keating 1999; 2000.

And so, although water retains universal characteristics, its great transmutability means that human interaction with water is context dependent. The uses, sounds, visions, colours and smells of water differ from time to time, place to place, culture to culture and person to person. Therefore, the use of water and the meanings people attribute to its presence cannot be assumed or taken for granted and with regards to a sensory archaeology, it is thus one element with multiple interpretations, similar to light.

Like in any society, past or present, water was certainly integral to Iron Age life too (both physical and social) and would have possessed multiple themes of meaning; with its importance noted in the classical texts (Mela 1998: III.48; Strabo 1917–32: IV.4.6). The Roman poet, Lucan (AD 39-65), for example, described a forest sanctuary in southern France: 'there were many dark springs running there, and grim faced figures of gods uncouthly hewn by the axe from the untrimmed tree-trunk' (Bord and Bord 1985: 7). Whereas the historian Livy (59 BC-AD 17) noted how Iron Age warriors used skulls decorated with gold as offerings to gods at holy wells. Furthermore, in Bath, a hot spring identified with an Iron Age goddess of healing – Sulis – became associated with the Roman health deity, Minerva (Irvine 1989); whereas Ptolemy described how Dorset was inhabited by a tribe known as the 'Durotriges', meaning 'water dwellers' (Hutchins 1973 [1861]: ii).

Though these examples could be considered anecdotal, water does seem to have been a special element, as noted in the previous chapter, experienced in a variety of ways and possessing various meanings in the Iron Age (see: Braund 1996: 12-21; Buxton 1994: 102-103; Cunliffe 1997:194; Derks, 1998; Green, 1986: 166; MacCulloch 1911: 181; Megaw and Simpson 1979: 405; Webster 1995: 449-451). Indeed, it is well known that Iron Age communities in Europe gave natural places and the elemental forces within them, such as water, symbolic significance[15]. However, as implied above, the meanings which are granted to water are often complex and tangled, and so studies which examine

[15] The importance given to water in the Iron Age (and throughout prehistory) is alluded to in many studies, including: Bradley 1990; 2000: 27; Braund 1996: 12-21; Briggs 1995; Brown 2004; Coles 1990; Coles, Coles and Jorgensen 1999; Fitzpatrick 1984; 2005: 161; Giles 2009; Glob 1969; Hegeager 1992; May 1992: 97; Rogers 2011: 647; Warner 1991; Webster 1995; Willis 1997; 2007.

its potential place within prehistoric communities tend to imply that its importance was somewhat peripheral.

For Scotland however, water was integral to the positioning of the domestic space, as demonstrated in the Chapter Six. As noted within that chapter, sites here were often incorporated into aquatic contexts, and so we can assume that water was rather central. No where is this more pertinent than in Orkney, and I wish to move on to ask how water was potentially experienced here. Let us begin then by examining the nature of Orkney itself; its many waterscapes and the relationship which Orcadian brochs had with them.

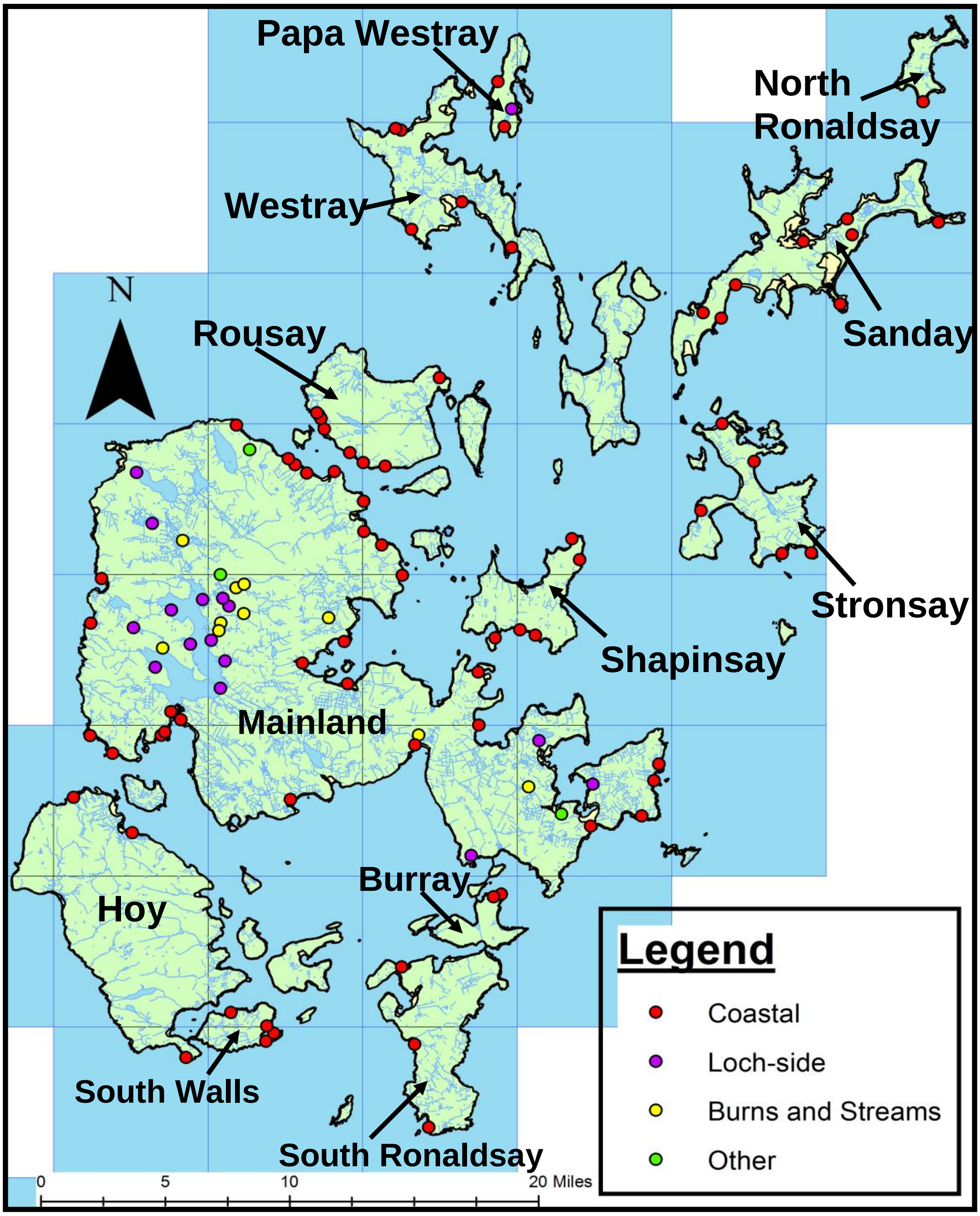
Aquatic Horizons: Iron Age Orcadian Waterscapes

Lying just off the north-eastern tip of the Scottish Mainland, and located upon latitude 59.68N, Orkney (Figure 7.2) comprises of approximately seventy islands and possesses a coastline of around 570 miles (representing 7.5% of the total coastline of Scotland and 4.7% of that of Great Britain; Doody 1997: 13). Located in the direct path of Atlantic depressions, strong winds are frequent (British Geological Survey and Scott Wilson Resource Consultants 1997: 26; Davidson and Jones 1985: 20; Marsh 2001: 20), and combined with the warming effect of the surrounding seas, Orkney is also very wet. But though its damp and windy climate is often commented upon, it is the sea which embodies these islands.

Enclosed by ferocious and perilous seas, and possessing some of the most dangerous stretches of water in the world, Orcadians have long been defined by the water surrounding them. With its whirlpools, tidal overfalls, skerries, stacks, caves, and its tragic history of shipwrecks (Ferguson 1988), the dangerous waters around Orkney are a constant source of fascination, with modern folklore identifying the sea as the dwelling of many supernatural beings. These include the marauding and magical ‘Finfolk, thought to regularly abduct fishermen; the ‘mermaid’ who desired a mortal husband; the shape-shifting ‘Selkie-folk’; and the ugly and clumsy ‘sea-trow’ who regularly stole fish from fishing hooks (Black and Northcote 1994; Marwick 1975; Muir 1998; 2014).

Such otherworldly creatures clearly represent the manifestation of powerful ideas about water in Orkney, with the sea being seen as both aggressor and benefactor (by providing food and livelihood). It has thus always been granted a special place in the Orcadian mind, and even for its Neolithic inhabitants, the sea seems to have been central; as Phillips' (2003: 373, 380) demonstrates, Neolithic monuments on the islands tended to be highly visible not from the

Figure 7.2. Brochs on the Orkney Islands according to their nearest water body; (as also illustrated in Chapter Six).



landward perspective, but from the sea (also see Richards 1996). With this in mind, we can likewise imagine that the sea held a significant place for Orkney's Iron Age society too, with their brochs. It is of note here that in order to include those stone-built Atlantic Roundhouses as noted in the last chapter (but which do not conform to the strict definition of 'broch', e.g. Quanterness) within this analysis, the term 'broch' shall be used as a shorthand for the whole heterogeneous class of Atlantic Roundhouses on Orkney (of which there are over a hundred).

The scale and density of Orkney's brochs suggests a degree of social complexity here, and like the island's Neolithic monuments, they too were clearly attributed to the sea (and were usually found on cliff tops; see Armit 1997a; Fojut 1982b), as examined in Chapter Six. However, given the apparent maritime nature of these coastal dwellers, Roberts (2004) has pointed out the complete absence of direct evidence for Iron Age seagoing vessels in the Atlantic Archipelago – let alone Atlantic Scotland – which one may consider strange when it is compared to the relative riches of the Bronze Age.

Indeed, throughout North-West Europe, discoveries of inland wooden water vessels (ferries and boats, including wooden plank boats) demonstrate that there was at least a knowledge of sophisticated boat construction techniques that existed from the Bronze Age onwards (McGrail 1995a; 2001). Indeed, much has been written on the sewn-plank boats of the British Bronze Age (e.g. McGrail 1988; 2001; Wright 1990; Gifford and Gifford 2004), especially on their construction, performance and their wide use as sea faring vehicles (Clark 2004; McGrail 2001; Van de Noort, Middleton, Foxon and Bayliss 1999). Their survival in comparison to the absence of Iron Age boats in Scotland is an important point of discussion, and Pryor (2004) has suggested that the survival of Bronze Age boats may largely be due to the specific ritual disposal of artefacts in boggy and watery places in the Bronze Age – even though such disposal obviously continues into the Iron Age (e.g. Bradley 1990b), but evidently did not commonly include boats.

Despite the obvious absence of sea going vessels in the archaeological record however, a variety of craft were probably used on the seaways (Rainbird 2007: 159). The lightness of construction of a hide boat or *currach*, which was essentially 'a hide or leather-proof covering fastened to a framework of light timbers' (McGrail 1995b: 264-265), would have had a great advantage in relation to buoyancy and beaching, especially in the awkward and dangerous tides of Orkney's coast. As we have also witnessed (especially in the Northern Isles), brochs were positioned with the coast in mind, and so one can imagine that such vessels would have probably been very common due to their capability of beaching with ease.

Though their survivability in archaeological deposits is significantly poorer than the plank boats of the Bronze Age (McGrail 2004), as noted, literary evidence for the use of vessels such as the currach in the Atlantic is found in numerous sources, including Ora Maritima (101-6) and more generally from a collection of Roman authors of the first century BC to the third century AD including: Pliny (Nat.Hist. IV.104; VII.205-6); Caesar (Bellum Gallicum 1.54); Strabo (Geographica III.3); Lucan (Pharsalia IV.130-8); Dio Cassus (Epitome, 48 19-19) and Salinus (Polyhistor II.3) (as cited in Henderson 2007: 54). As Cunliffe (2001: 66-68) argues, the fact that such vessels have been noted by classical authors (of which there are many) suggests that these vehicles were plentiful and must have constituted a distinctive feature of the Atlantic seaways.

However, using these boats to venture out onto the waters that separate the Orkney Islands would have been perilous in the Iron Age, as it still is today, and travel between Mainland Britain and the Orkney Isles must have been renowned for its danger. Considering the hazards of the sea in this northern extreme then, it is interesting then that so many Orcadian brochs overlook the sea. In doing so however, they also tended to be positioned in some of the most vulnerable areas of coastal erosion (e.g. the brochs of Breckness, Gurness, Borwick, Midhowe, Verron, Breckness, and St Boniface and Munkerhoose on Papa Westray). Indeed, many brochs in Orkney are currently in danger of eroding into the sea (Breckness being a prime example, as noted in the previous chapter; see: Ballin-Smith 2002; Ballin Smith and Ballin 1993; Laing 1867: 63; Lynn and Campbell 1995: 104; Smith and Lorimer 1987: 33-34). Of course, we should consider that Orkney's shoreline may have simply eroded and sites once inland are now closer to the shore (see Ashmore 1994).

However, as Fojut (1982b: 40) states (with regard to Shetland at least), the sea-level has been limited only to a slight rise and has thus resulted in little loss of land. But even if Orkney's coastline has changed since the Iron Age, such brochs were clearly attributed to the sea and were intended to be observed not only from the land, but especially from the coastal perspective, and this is also true for those brochs overlooking the sea-lochs of Harray and Stenness. Indeed, the common preference to build brochs upon cliffs overlooking the sea in Orkney (for Shetland, see Fojut 1982b) suggests that these brochs were landmarks for mariners. It could even be that coastal brochs were marking the edges of these islands, suggestive therefore of an insular culture expressing a 'communal' identity.

Cunliffe (2001: 349-362; cf. Rainbird 2007: 160) thus calls these brochs '*cliff castles'*, suggesting that defence is an understandable function given their location, and when venturing out to the Knowe of Verron broch on the cliffs near Skail Bay, one is indeed struck by the overt defensibility of the site's location, especially when approaching from the sea (Figure 7.3). Borwick broch is similar in this regard (Figure 7.4); with both of them surrounded on three sides by sheer

Figure 7.3. Knowe of Verron Broch, Skaill Bay. *Author's Photo.*

drops into the sea. Many others on Orkney, whether they be on cliffs or lochs, are likewise bordered by water, and include the brochs of Clumly, Eve's Howe, Finstown, Burrian, Ness of Woodwick, and Scockness, among others. But it seems easy to regard this as purely practical; as a means to observe and to be observed, or as a simple act of defence.

As noted at the end of the previous chapter, although the defensive practicality of water-side positioning seems obvious to us, these were certainly not convenient locations for the domestic space. Like the Atlantic Roundhouses

Figure 7.4. Borwick Broch, Yesnaby. *Author's Photo.*

located within the lochans of North and South Uist (as noted in Chapter Six, and including sites such as Dun Torcuill, Dun an Sticir, Dun Nighean Righ Lochlainn and Dun Ban), Orcadian brochs were often positioned on the margins of the landscape; places prone to change and gradual descent into the sea itself, with many being built in areas vulnerable to coastal erosion, as already noted (e.g. Gurness, Breckness, Borwick, Midhowe, Verron, and St Boniface and Munkerhoose on Papa Westray). Generations living within these structures would have thus held witness to the turbulent nature of the North Atlantic and how it literally eats away at the landscapes that lie on the periphery of the broch. Like loch-side brochs too, such positions constituted liminal places – an abstract term for areas that are in-between, e.g. water and dryland (the ebb), earth and sky (mountain peak), darkness and light (a cave) (Lück 2003: 197). Indeed, broch positioning is usually highly liminal; places where land met water (like marshes and bogs), and where the ground beneath one's feet was insubstantial and often treacherous.

Therefore, this positioning not only implies a symbolic rather than (or as well as) a practical intention, but it also suggests that many Orcadian brochs were not only meant to be located near water sources, but were intended to literally rise out of them. The broch, seeming to rise out of the water, would not only have emphasised its position on the edge of the landscape, but would have symbolically attached the tower to water itself. This attachment suggests brochs were more than defensive landmarks in Orkney, and that in their landscape context, they were symbolically linked with the water around them. Such sites do not just include the cliff brochs of course, but also the many brochs located within or upon the edge of the sea-lochs of Harray and Stenness in the centre of Orkney Mainland. Indeed, as noted, many Orcadian brochs are literally bordered by water, usually on three sides at least, and include the brochs of Loch of Clumly, Borwick, Dishero, Eve's Howe, Finstown, St Mary's, Knowe of Burrian, Loch of Tredwell, Burrian, Ness of Woodwick, Scockness, Skail and Knowe of Verron, among others (Figure 7.5).

The significance of such positioning is obviously hidden from us, though I would certainly not conclude that this marginal positioning was solely a means of locating the domestic space within a fertile landscape, as explored in Chapter Six. Indeed, as the control of water essentially represents the control of life, we could speculate that such positioning represented a 'control' over water (as a significant agricultural element), perhaps in response to the dramatic change in climate, from warm and dry to cool and wet in the Late Bronze and Early Iron Age. (Henderson 2007: 36; cf. Barber, Chambers and Maddy 2004). As explored in Chapter Three, as Orkney (and Scotland in general) became colder and wetter from around *c*. 600 BC onwards, peat and heather would have claimed agricultural land previously available during the Neolithic and Bronze Ages (Bell and Walker 1992: 72) and, in response to the limited pockets of land available, control over land and other resources may have promoted territoriality, with the broch not only acting as a symbol of establishment, but also as a means of reasserting human control over nature, as argued by Parker Pearson and Sharples (1999b: 364); a theme briefly alluded to in Chapter Four.

Figure 7.5. Examples of Orcadian Brochs bordered by Water. *Author's Photographs.*

Tredwell Broch, Papa Westray

Burrian Broch, Russland.

Loch of Ayre

Loch of Clumly

However, it is doubtful that this is how Iron Age Orcadians conceived this relationship. While all societies – prehistoric and otherwise – seek some degree of control over their environments, the notion of 'control over nature', as a form of overall dominion is taken for granted in most contemporary Western societies (Hallowell and Brown 1992: 63; Helmreich 2011: 132; Latour 1993: 13; Strathern 1980: 181; Zawadzka 2011: 14). Hunter-gatherers and other indigenous societies, even today (a) do not conform to a dualistic (alienated) vision of culture-nature or humankind vs. 'the other' (Champagne 2007: 79) and, (b) tend to cast the relationship in more reciprocal and egalitarian terms (Strang, May 13, 2014, personal communication; cf. Bookchin 1993; Descola and Pálsson 1996; Ingold 2000b).

For Orkney, I would instead argue that the exaggerated connection between brochs and water (and especially the sea) may relate to the hazards and dominance of the sea in this northern extreme, with the construction of the water-side broch not so much reasserting control over water, but instead acting as a means of appeasing or negotiating with the non-human forces thought to reside within a changeable watery realm (cf. O'Sullivan 2009: 81).

Calming the Waters: Brochs as Appeasers?

Undeniably, the sea around Orkney is notoriously unpredictable and dangerous, and venturing out onto it is perilous, with travel between Mainland Britain and Orkney being renowned for its danger. The Pentland Firth, separating Orkney from Mainland Britain, is considered one of the most dangerous stretches of open water in the world, possessing one of the strongest tidal streams in Northern Europe (Lawrence 2003: 108) – so powerful, it has been dubbed the Saudi Arabia of tidal power (Salmond 2006). Indeed, the tidal races in the Pentland Firth are notorious and some even have names, including the Duncansby Race, the Merry Men of Mey, and the infamous 'Swilkie' whirlpool, derived from the Old Norse 'Svelgr', meaning the swallower (Prandle 1978).

We can thus assume that a good regional knowledge of the sea and its 'acceptable' routes were well-known, aided by the repetition of nautical folklore. The hazardous sea and the routes taken across it would have thus inspired myths, sagas and legends, marking certain sections of the coast as either revered or tabooed areas; perilous places with dangerous histories attached to them. Such attachments need not be confined to the sea either, with certain lochs, streams and rivers across Scotland probably holding their own stories and myths, perhaps involving spiritual and magical beings akin to recent Orcadian folklore (e.g. the selkie, the sea-trow, and the water horse). On this note, it is interesting to explore those brochs near one of the most dangerous sea routes Orkney possesses: Eynhallow Sound between Mainland Orkney and Rousay.

This stretch of water is one of Orkney's most difficult to navigate, with reefs, shoals and difficult tides making it a dangerous area to land a boat for even the most experienced boatman. This is especially pertinent around the island of Eynhallow itself, which has extremely strong tide flows on either side, as well as overfalls (Figure 7.6), which makes any boat approaching or leaving the sound liable to overturning. These ferocious tides, known locally as 'roosts', are infamous, influencing the rhyme:

Figure 7.6. Tidal Races between Mainland and Eynhallow.
Author's Photo.

"Eynhallow fair, Eynhallow free,

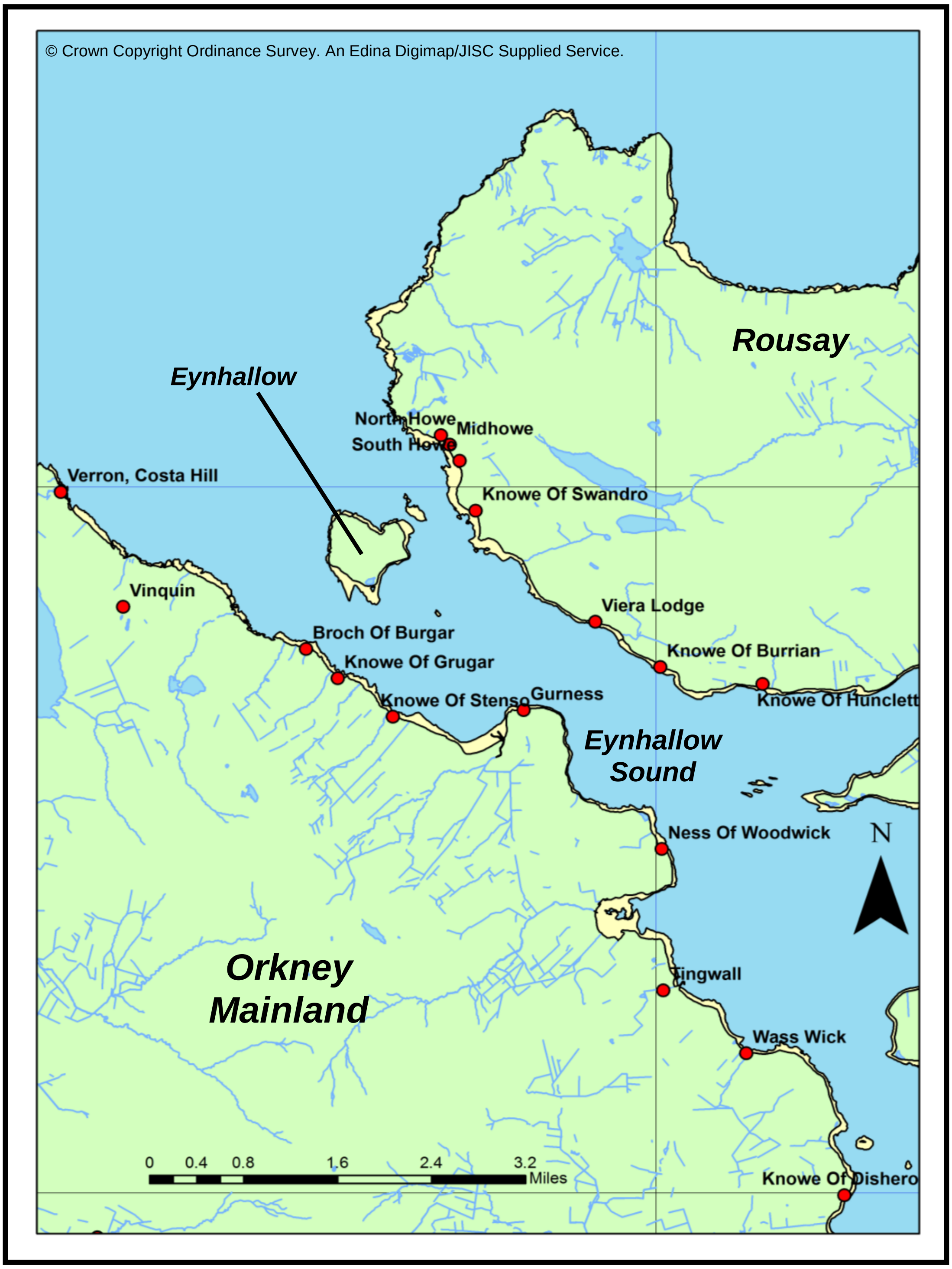
Eynhallow stands in the middle of the sea,

With a roaring roost on either side,

Eynhallow stands in the middle of the tide."

The common loss of boatmen around Eynhallow probably influenced not only the construction of a monastery on the island (perhaps as a means of protecting those sailing across these waters) but also the legend that the island was once a home for the 'Finfolk' – a race of dark sorcerers possessing powers over

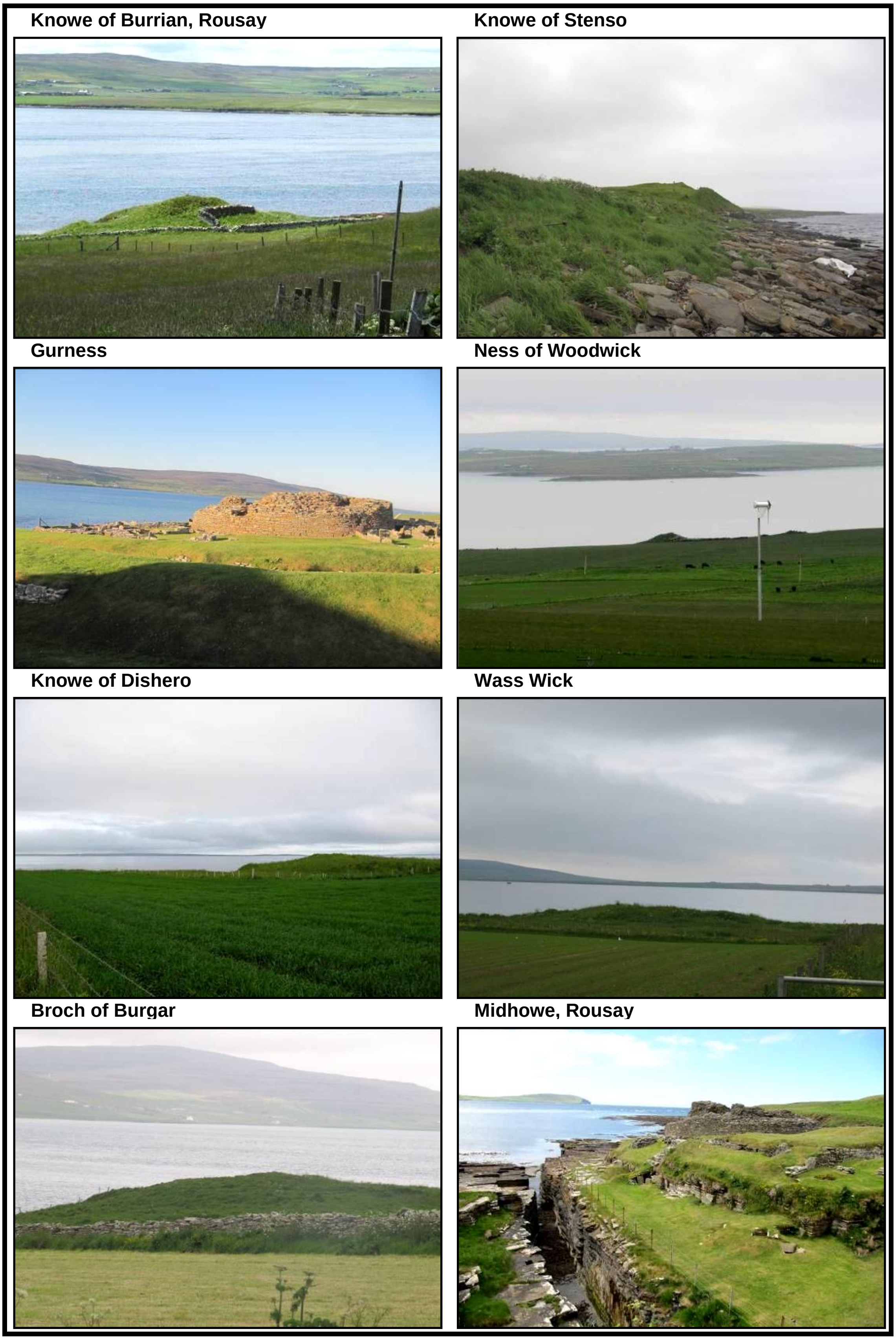
Figure 7.7. Location of Brochs upon Eynhallow Sound.



storm and sea, and who abducted fisherman who ventured into their territory

(Curran 2010: 27; Dennison 1995). According to traditional folklore on Orkney,

Figure 7.8. Sample of the Brochs which overlook Eynhallow Sound.
Author's Photos.



Eynhallow was once known as 'Hildaland' – the vanishing island summer home of the Finfolk which only appeared at certain times of the year and which was later taken from them and renamed Eynhallow; a name derived from the Old Norse for ‘Holy Island’.

It is unsurprising that Eynhallow, an island often dangerously shrouded in mist (hence the idea of Eynhallow as a vanishing island perhaps) and surrounded by hazardous rocks and fierce tides, was believed to be the Finfolk’s home; a race of proficient boatmen and powerful sorcerers who abducted fishermen at will. This not only demonstrates how folklore acts as a way of comprehending disappearances and deaths at sea, but it also illustrates how places of death (or transition – a move from the material to the non-material; from the concrete to the fluid; from land to sea) are often ascribed a special status and become prone to folktale creation (also see Strang 2009). It is interesting then that over twelve brochs surround Eynhallow Sound (Figures 7.7 and 7.8), two of which are the most impressive Orkney boasts of – Gurness and Midhowe.

The central tower of Gurness has been interpreted along with other broch villages as representing an elite residence or kinship group (Armit 2003: 97-8; 2006: 254; Foster 1989a; 1989b; Dockrill, Outram and Batt 2006) and its three surrounding ditches have been thought to emphasise this high status. Indeed, the enclosure is striking in its enormity with its largest ditch being 91m long, around 4m wide at the top, and possessing a depth of 1.5 to 2m (Hedges 1987c: 46). Together with a series of two other, thinner ditches, the enclosure seems to mimic the effect of waves as one approaches (Figure 7.9), with the site’s proximity to the coast emphasising this appearance further (though it should also be noted that the nature of these ditches may have been exaggerated or diminished through excavation).

Traditionally, enclosing ditches around Iron Age sites have been thought to be defensive features; though, of course, the archaeological evidence for warfare, conflict and violence at Scottish Iron Age sites and enclosures is limited (Toolis 2007: 308-10) and ambiguous (c.f. Bowden and McOmish 1987) – though, of course, our judgement on what constitutes ‘warfare’ may be obscuring the reality of pre-state ritualised and embedded warfare (Armit 2007; Sharples 1991a; James 2007; cf. Chadwick 2007; Giles 2007a; 2007b). Whatever the purpose of Iron Age enclosure however, it is obviously a complex picture, and there is no definite interpretation as to their function (Collis 1996: 87; Meek, Shore and Clay 2004: 17). Indeed, they were probably expressing a variety of symbolic and ideological statements at different periods of time, and so there are a range of potential functions for enclosed places in Scotland (e.g. Ralston 2006: 19-24). Idiosyncrasy must have played a substantial role however, and when considering the significance attached to water in Orkney, it may have played a role at Gurness.

Figure 7.9. Gurness Ditch System. *Author's Photos.*

The effect of the ditch and it's wave-like appearance makes it appear as though the broch was built upon water itself and the view of the enclosing ditches from the wall head of the broch would have further emphasised this appearance; providing a 360° view of these ripple-like ditches. Further, when the enclosure in the north-west section of Gurness site was excavated, there was discovered an area of triangular masonry which ran from under the outer rampart to the north,

Figure 7.10. Plan of Gurness Interior. After: Hedges (1987c).

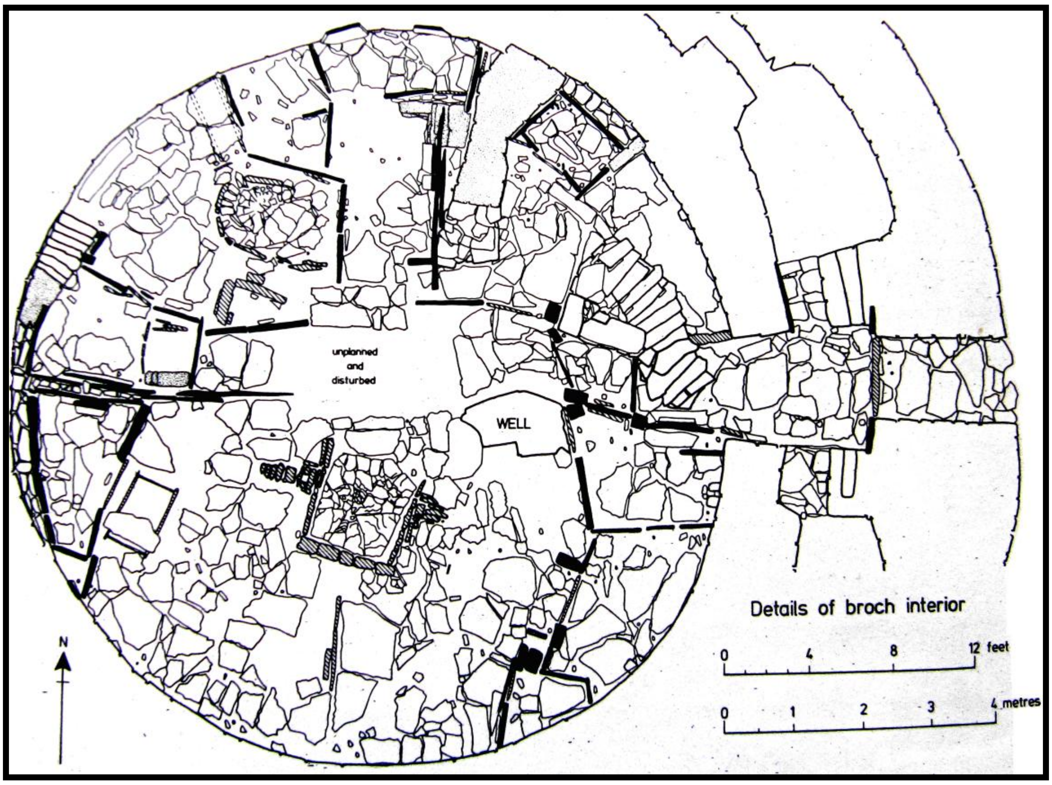
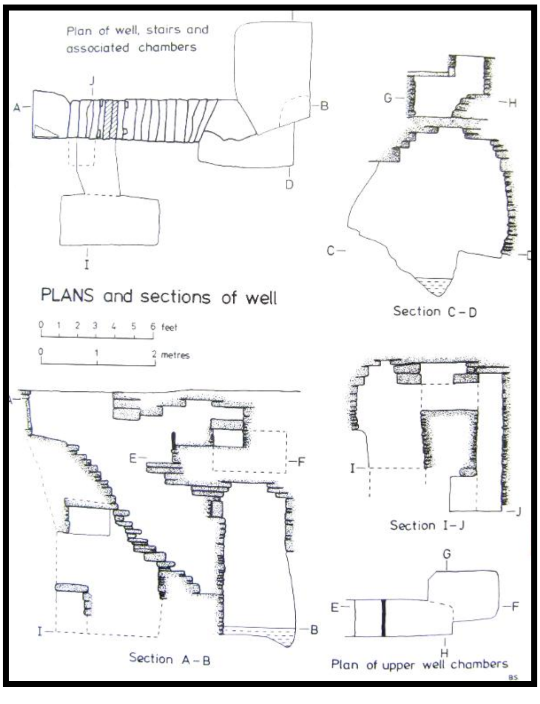


Figure 7.11. Photograph, Plan and Section of the Well at Gurness.

Author's photograph down the well.

Plan and section of Gurness well.
Copyright: RCAHMS

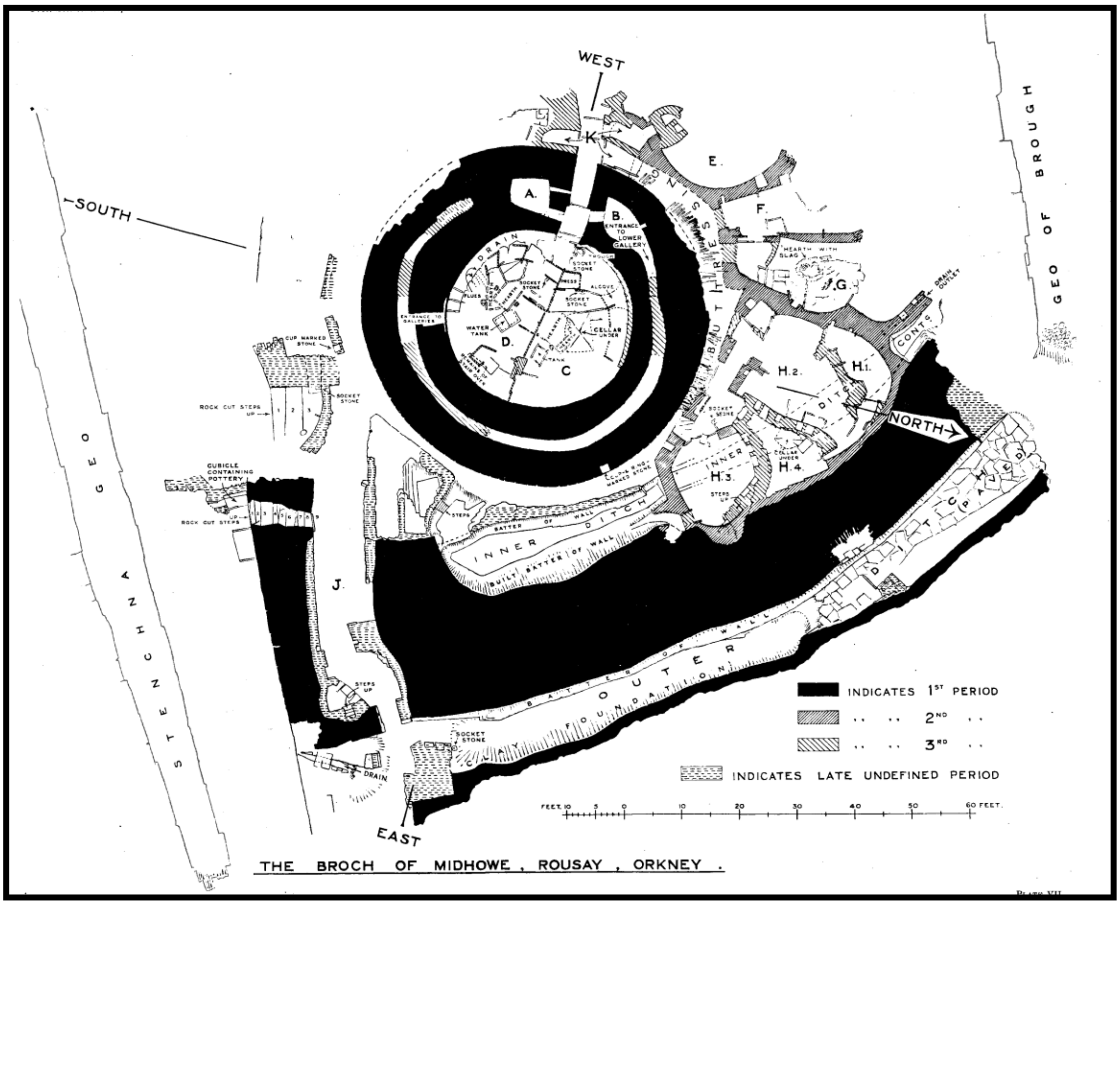


wherein there lay a trough-shaped depression lined with large and small stones which sloped towards the sea (Hedges 1987c: 63). When these stones were lifted partial paving was revealed and even though this constituted quite a steep incline from the sea to the ditch systems of the broch, this continuation of the outer ditch to the sea was thought to be a boat slip (Hedges 1987c: 63). However, it is interesting that this feature links the sea to the ditches themselves; thus creating a real connection between the water and the broch.

This is speculation, of course. However, together with the construction of a ‘well’ – which was 5.5m in diameter and *circa* 4m deep – below the floor level of Gurness (as seen in both Figure 7.10 and 7.11), it is possible that there was a relationship being expressed here between water and the broch; further articulating something about Gurness’ position in the landscape, overlooking Eynhallow Sound. However, though this connection is powerful at Gurness, no where is the relationship between water and the broch stronger than at Midhowe on Rousay (Figure 7.12).

As the nearest Iron Age structure to the most dangerous point of Eynhallow Sound, Midhowe faces the overfalls to the north-east of Eynhallow (which I could see clearly when I visited the site), and it is perhaps by virtue of this position – which may be marking the site as a boundary – that Midhowe is

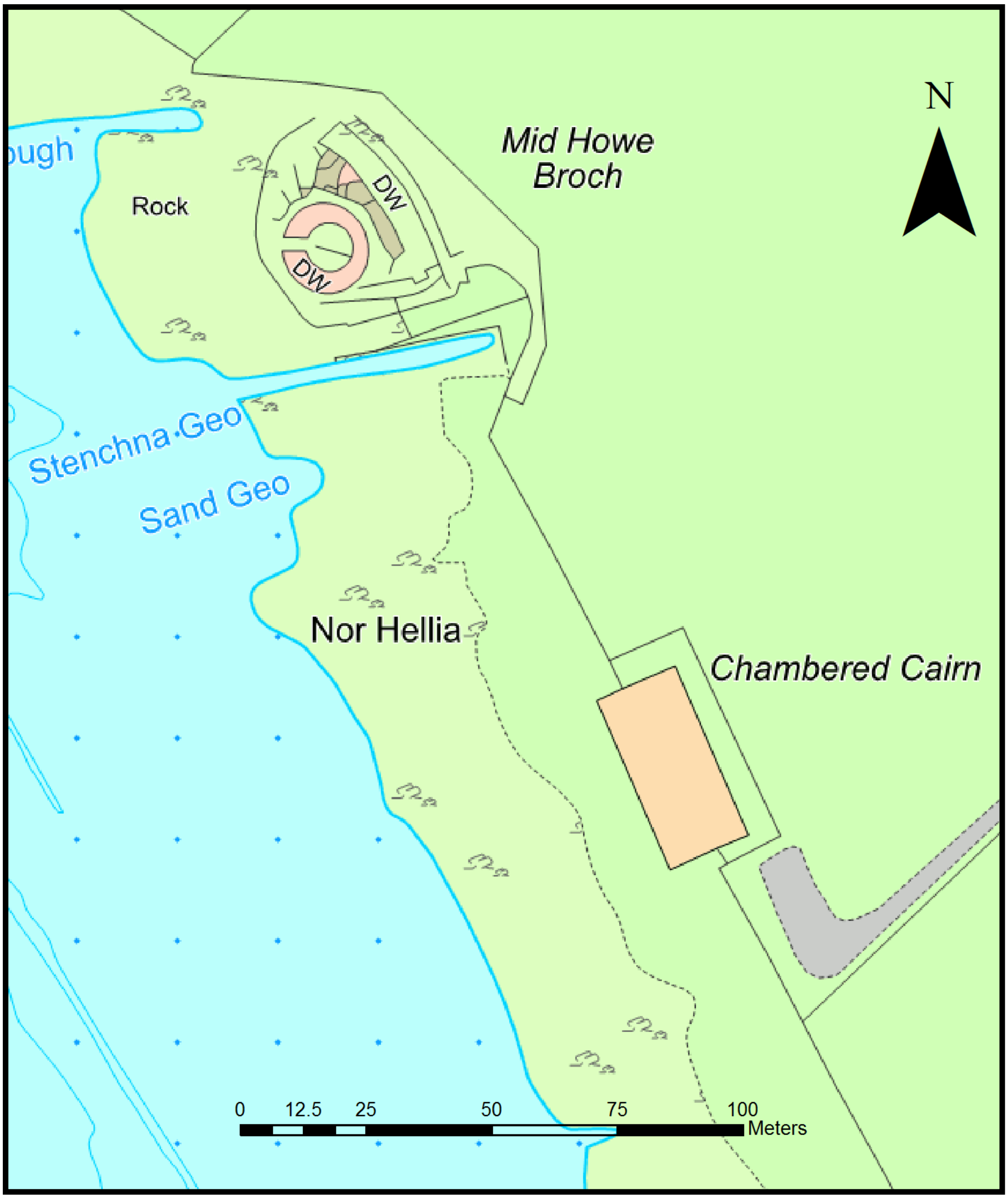
Figure 7.12. Ground Plan of Midhowe Broch, Rousay.
(After: Callander and Grant 1934a: 515).



granted a few disparities to the usual Orcadian broch, which may be emphasising this location as significant (or dangerous). First, Midhowe is very close to the largest Neolithic stalled cairn in Orkney (also called Midhowe) (Figures 7.13 and 7.14) and has two cup-marked stones built into the broch structure itself (Callander and Grant 1934a: 485).

And second, it is one of only two brochs in Orkney that is orientated west rather than east or south-east (Crowther 2011: 55), with its entrance directly facing the overfalls, even framing them in its doorway (Figure 7.15). This seemingly

Figure 7.13. Relationship between Midhowe Broch and Midhowe Chambered Cairn.



opposing orientation is interesting when considering how the doorway looks towards the overfalls; a tidal category renowned for overturning boats, and so

Figure 7.14. View of Midhowe Neolithic Cairn from Midhowe Broch; and view of the Cairn within its modern enclosure. *Author's Photos.*

Midhowe Neolithic Cairn (within modern enclosure), viewed from Midhowe Broch

Midhowe Neolithic Stalled Cairn

this opposing orientation may allude to the possibility of reversal here, a theme to be explored later.

A special status can thus be granted to Midhowe because of its coastal position, the fact that it also overlooks dangerous waters, that it is orientated away from the norm, and that it is positioned close to one of the most prominent Neolithic structures in Orkney – a building apparently dedicated to the ancestral dead (cf. Hingley 1996). Perhaps most interesting however is that like the broch of Gurness – which also overlooks Eynhallow Sound – a 'well' was constructed within the floor of Midhowe, and for both these sites, this may be articulating something about their position in the landscape, overlooking these hazardous waters.

'Wells' are not isolated to Midhowe and Gurness however (see Figure 7.16), and are found within many Orcadian brochs (e.g. Breckness, Burroughston,

Figure 7.15. Midhowe Entrance: Facing West, directly towards the Tidal Overfalls of Eynhallow Sound.
Author's Photo.

Knowe of Redland). Interestingly, many of these also overlook dangerous stretches of water. For example, Breckness faces the notorious waters at the entrance of Hoy Sound (which include overfalls and tidal races), as does Warebeth Cemetery broch (Figure 7.17), with its well cut into the bedrock and

Figure 7.16. Locaton of Brochs which possess Wells in Orkney.
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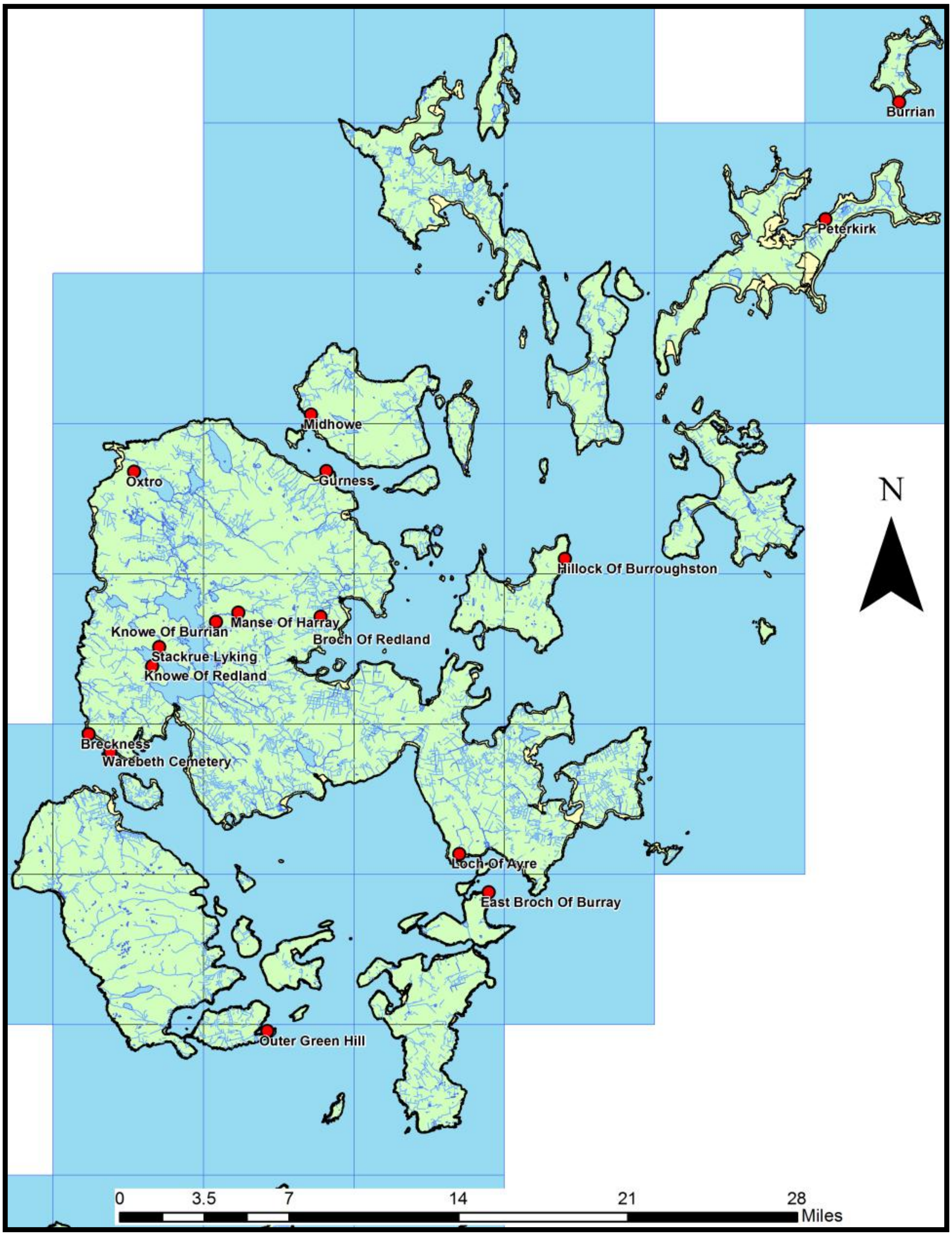


entered by an almost vertical staircase (Hedges 1987b: 91-92). Burroughston, on Shapinsay, which also has a well, overlooks dangerous tidal currents on the north-eastern side of the island (Figure 7.18), and the Broch of Burrian on North Ronaldsay (Figure 7.19), with its well, overlooks dangerous the tidal-races and overfalls which lie to the south-west of that island (Adair 2012: 61-62). Outer Green Hill, South Walls, has a well and overlooks the tidal races near Cantick Head (Figure 7.20). Away from Orkney, a well-like structure was even found within the floor level of Jarlshof in Shetland too (Bruce 1907: 16); a broch overlooking the infamously ferocious waters off Sumburgh Head (known as the ‘Sumburgh roost’; Smith and Jex 2007: 248); suggestive of a connecting ideology here (Figure 7.21). Back in Orkney, other wells are found within brochs that are either overlooking or are even within lochs too, such as we see at Loch of Ayre and Knowe of Redland on Mainland Orkney (Fraser 1927: 53).

Figure 7.17. Location of Breckness and Warebeth Cemetery Brochs, overlooking the Dangerous Tidal Races of Hoy Sound. (Areas of Tidal Races are depicted as Wave Symbols)

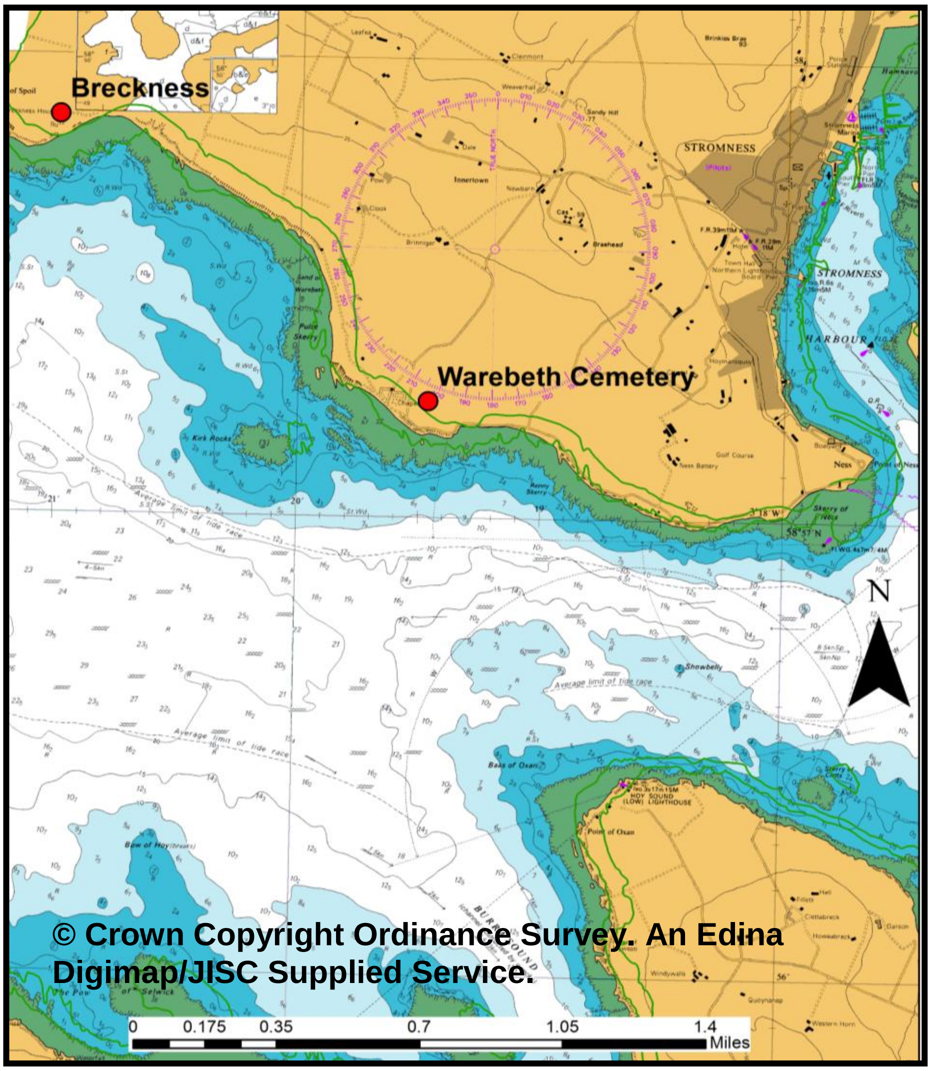


Figure 7.18. Location of Hillock of Burroughston Broch, overlooking Tidal Races to the East of Shapinsay. (Areas of Tidal Races depicted as Wave Symbols)

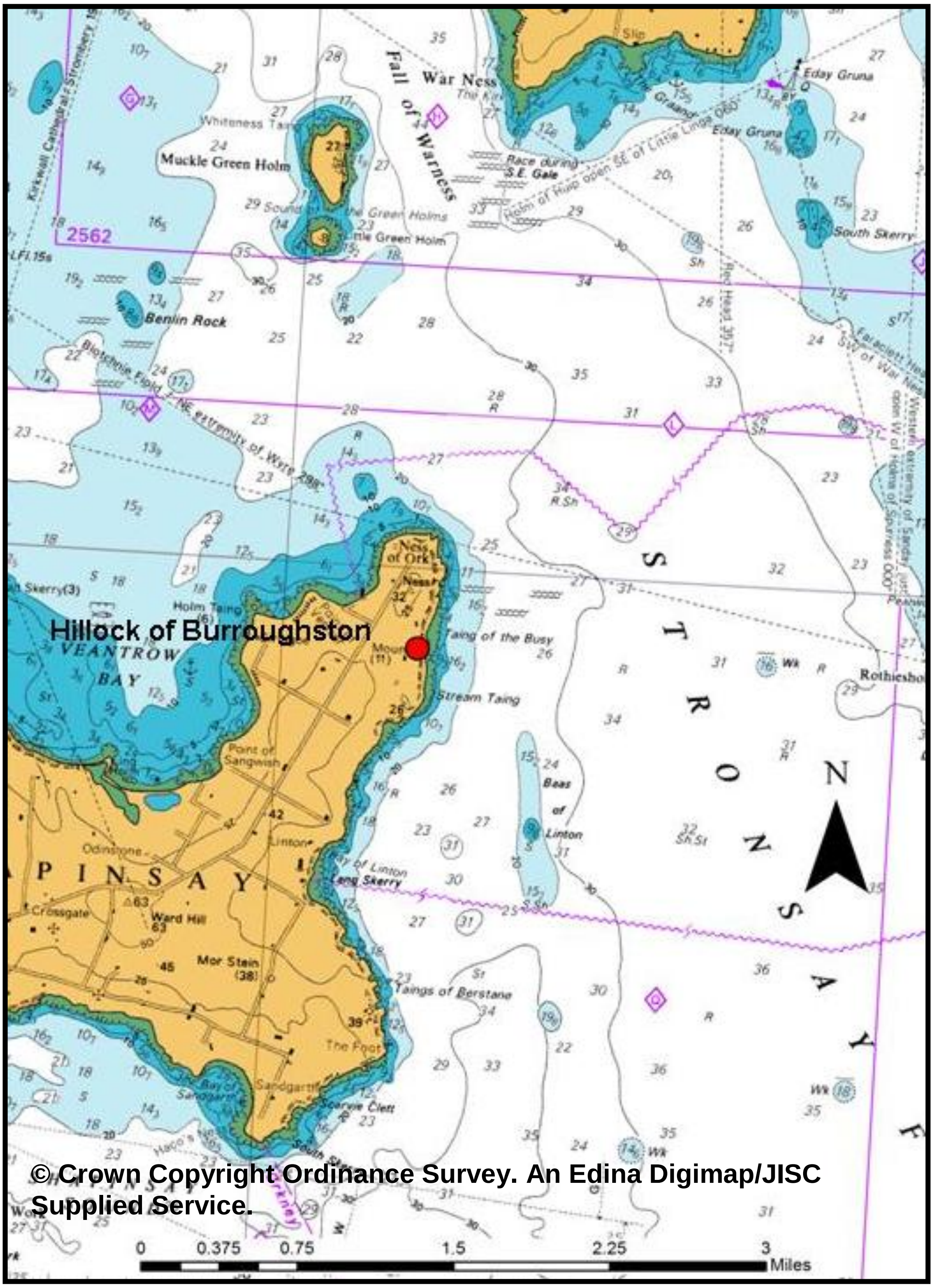


Figure 7.19. Location of the Broch of Burrian, overlooking Tidal Races to the South of North Ronaldsay. (Areas of Tidal Races are depicted as Wave Symbols)

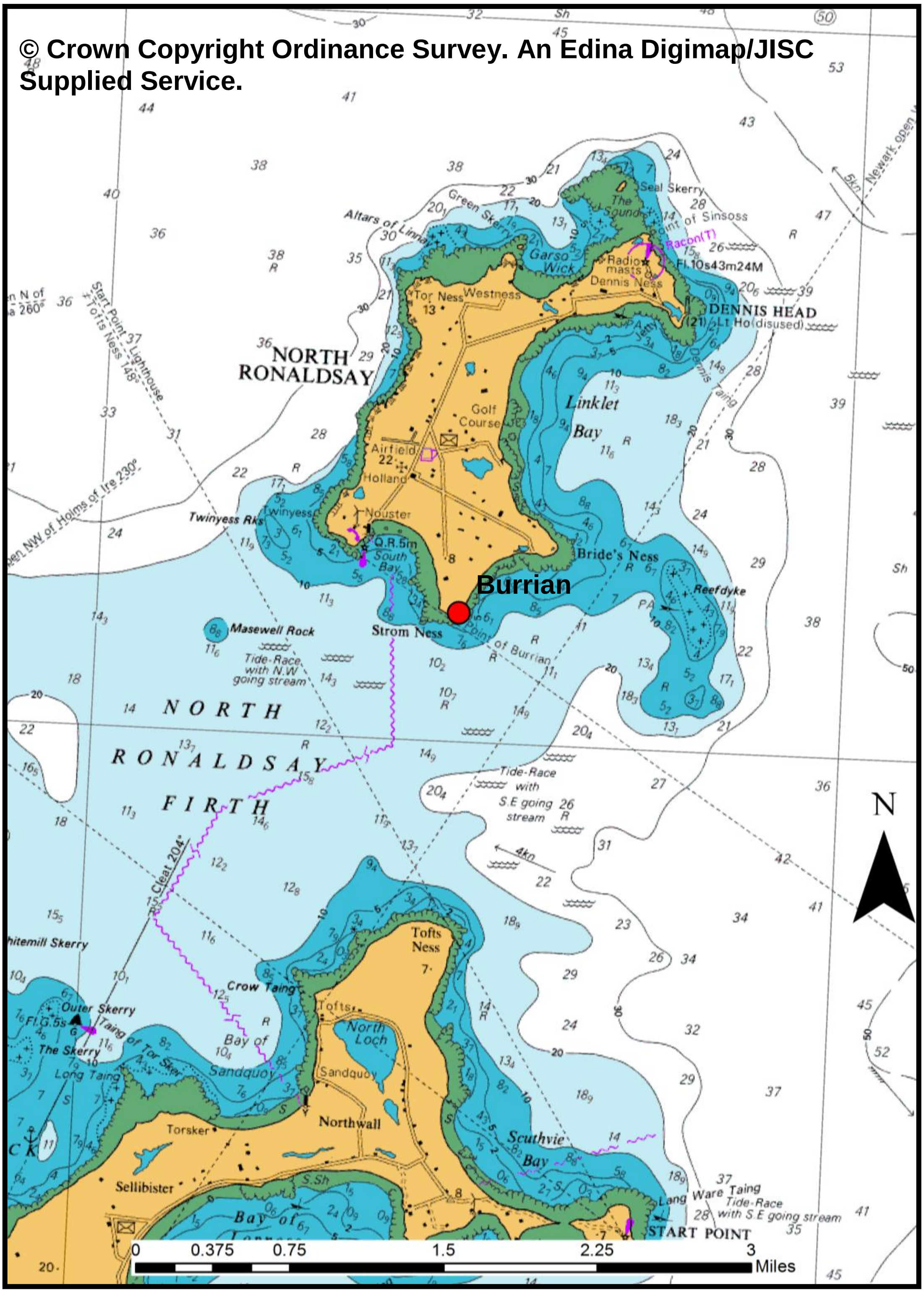


Figure 7.20. Location of Outer Green Hill, South Walls, overlooking the Tidal Races near Cantick Head. (Areas of Tidal Races are depicted as Wave Symbols)

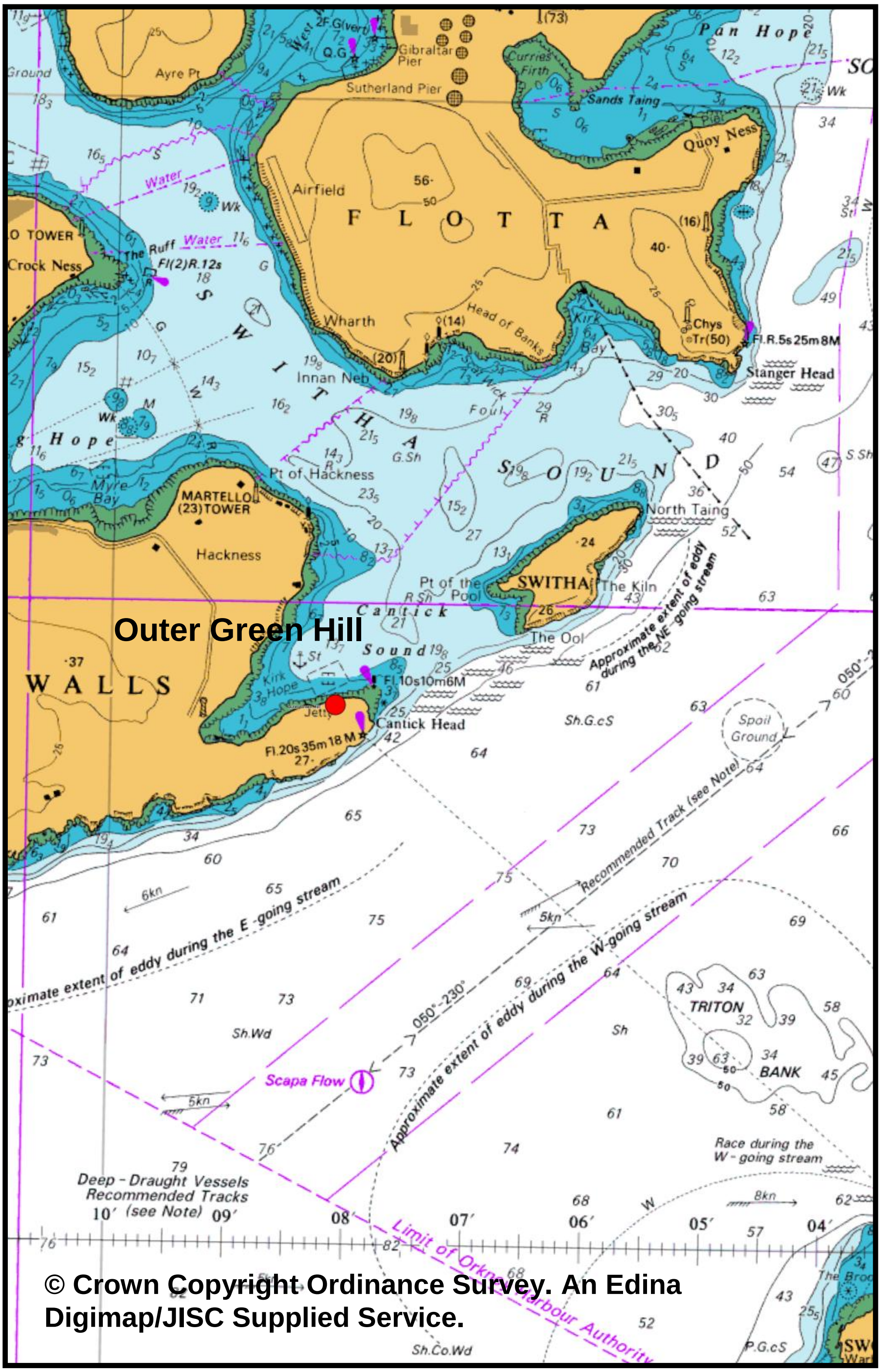
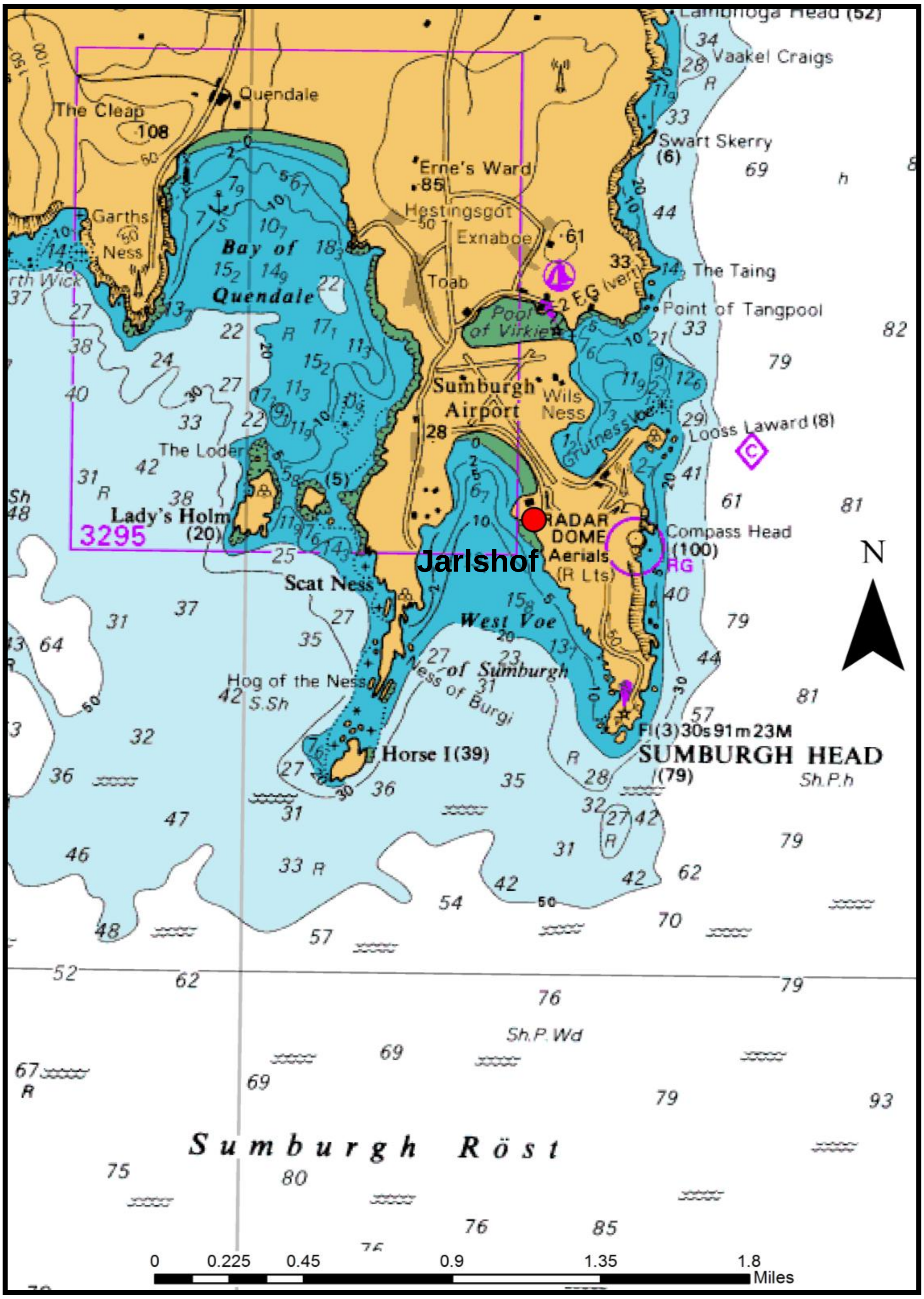


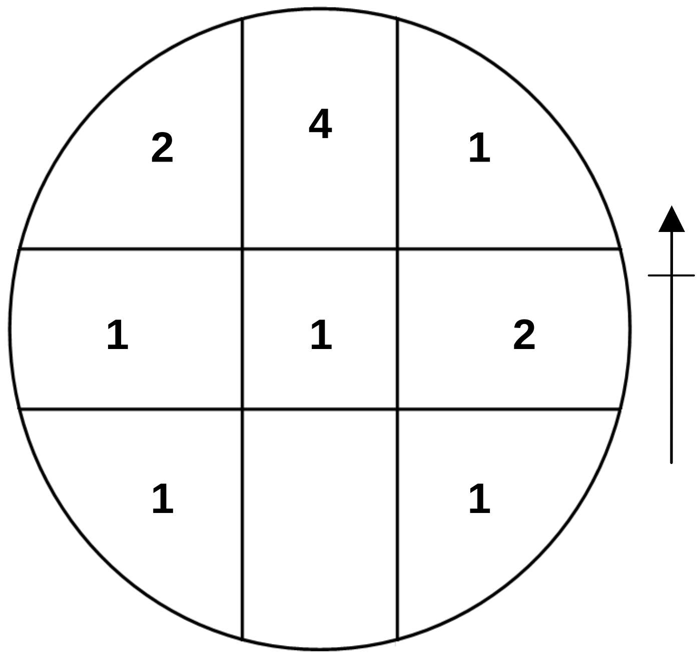
Figure 7.21. Location of Jarlshof, Shetland, overlooking the Tidal Races of the Sumburgh Roost. (Areas of Tidal Races are depicted as Wave Symbols). © Crown Copyright Ordinance Survey. An Edina Digimap/JISC Supplied Service.



The close relationship which Orcadian brochs obviously had with the water in the landscape suggests that the 'well' may have thus acted as a means of negotiating with the non-human forces which were perhaps thought to reside within water, or, fluid realms. Indeed, if turbulent waters were seen to be magical or spiritual abodes, then the water sourced near them would have been regarded as particularly special, or powerful, and as a maritime culture, negotiation with these forces may have been significant. This suggests that water (and perhaps land too) was conceived as something sentient in Orkney, as it is in most societies with 'nature religions' (see Strang 2011), and the 'votive' offerings made to watery contexts throughout Iron Age Britain suggest this to be the case. However, to comprehend the subtle meanings attributed to water and the 'well' in Orkney, we need to explore the wells themselves.

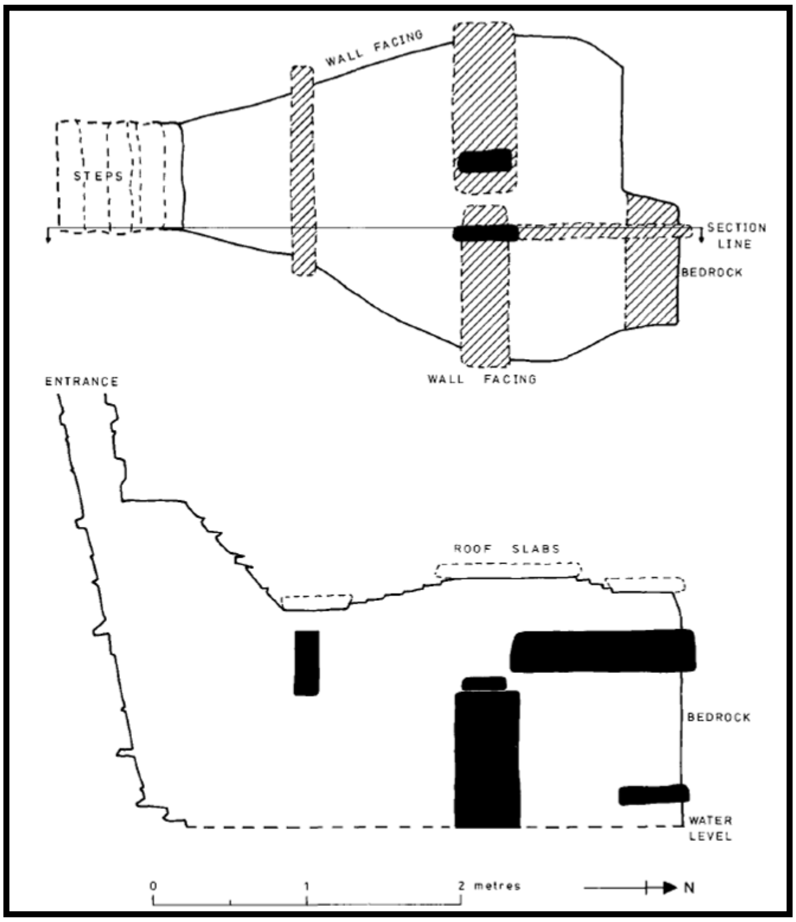
What is most obvious for broch wells is that their subterranean nature was of overriding concern, aside from whether they held water that could be artificially or naturally supplied. Deep underground, they were sometimes even covered, thereby creating the darkness of night within. With seven out of thirteen surviving Orcadian examples positioned in the northern quadrant of the broch (e.g. Burrian, Burroughston, Loch of Ayre, Midhowe; also see Figure 7.22), and often possessing a steep flight of stairs into the well (as at Midhowe, Gurness (Figure 7.11), Warebeth Cemetery (also see Figure 7.23), Knowe of Redland, East Broch of Burray, Burrian, Hill of Works, Loch of Ayre, Netlater, Oxtro, and Redland in Orkney; Jarlshof in Shetland; Hillhead, Keiss, Keiss Road, and Kettleburn in Caithness, and Kintradwell in Sutherland; see Graham 1949: 76) light was also intentionally minimised within many.

Figure 7.22. Position of Orkney Wells.



These features would have also hindered any draughts however, thus permitting the freshwater within the well to remain still.

Figure 7.23. Plan and Section of Well at Warebeth Cemetery.
After: Bell and Dickson (1989: 111; Illus. 6).



This may be of interest because as many of these wells often overlook dangerous seaways, the need for still water may have related to an appeasement of the turbulent (undrinkable) waters which the broch was often located near, thus alluding to a form of sympathetic magic in which such internal logic may have been appropriate.

This suggests that brochs possessing wells may have held a surveillance function – a role in maintaining a watch over the more dangerous fluid realms, while also acting as landmarks for mariners. Like lighthouses, Orcadian brochs – often located in hazardous and eroding areas of coastline – may have further served as liminal boundary markers, not just between land and sea, but also between concrete and fluid realms; between the material and non-material; with the structure and the well acting as an appeasing or mediating force between them.

However, it should be noted that the subterranean well also strongly alludes to a belief in a watery underworld. The sun, stars and moon rise and fall from the horizon, which at least suggests the existence of an underworld (Tuan 1974: 131), and in Orkney, just past the northern extreme of Scotland, the sun rises and sets into the sea (at least throughout the spring and summer). The fact that the sun seems to sink into a watery underworld may have influenced cosmologies here and suggests that water may have been part of a system which gave significance to, and associated water with, the underworld. On this note, I wish to examine another subterranean ‘well’ in Orkney which emphasises this relationship between architecture, water, light and a notion of an underworld to an extreme – Mine Howe.

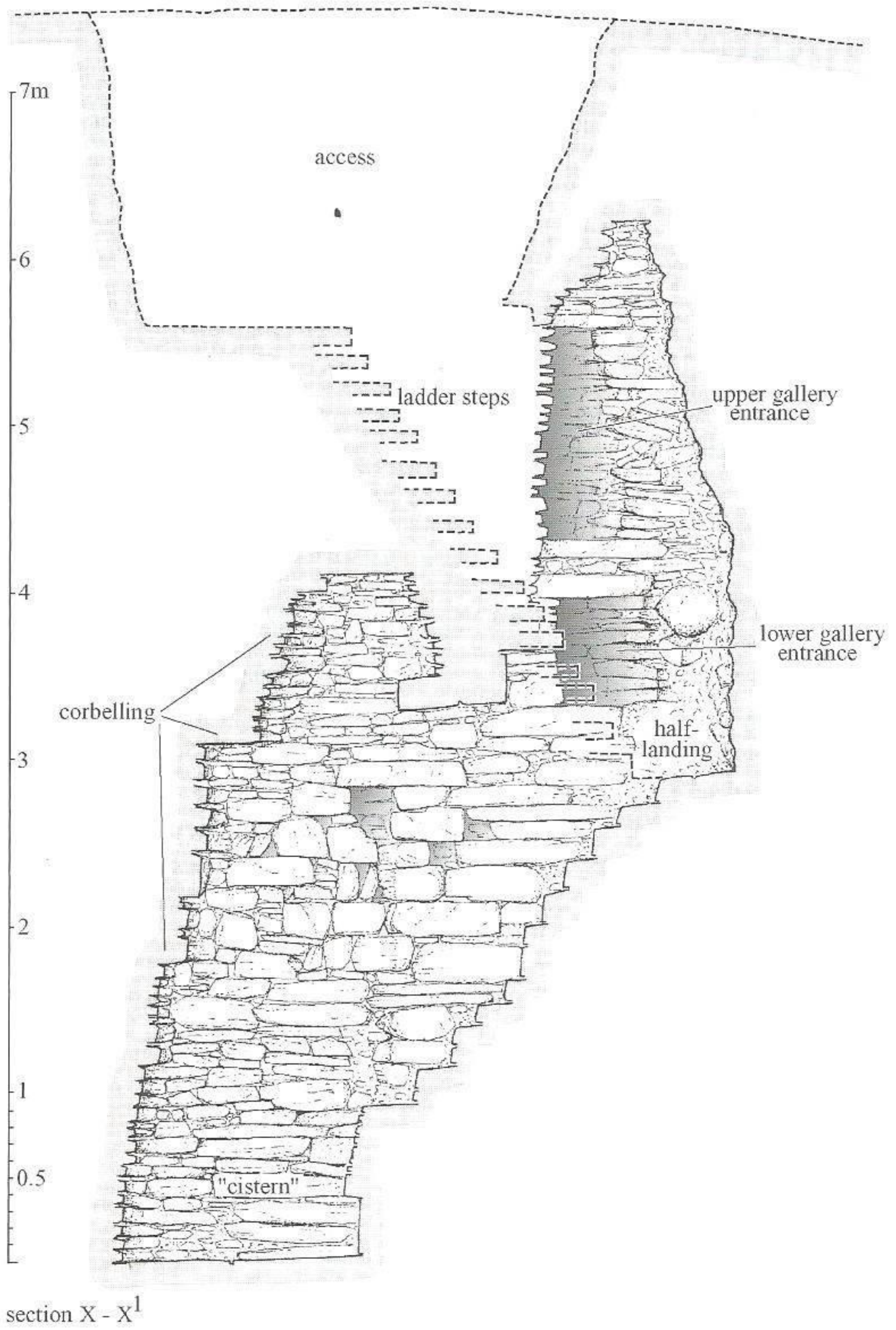
Mine Howe: Reflected World of Iron and Water?

The underground structure of Mine Howe (Figure 7.24) is entered from the top of a large sub-circular glacial moraine (Card, Downes and Gibson 2000) that is raised about 4m above the surrounding landscape, and from the outside, it is reminiscent of Neolithic tombs on Orkney such as Maes Howe, Unstan and Cuween Hill (see Figure 7.25; though one should also be aware that the appearance of some cairns have been improved as a result of excavation). However, the mound of Mine Howe would have been even more prominent in the landscape in the Iron Age than it is today (Card, Downes and Ovenden 2005: 325).

Though the original entrance arrangement was not ascertained through archaeological investigation (lest the underground structure became liable to collapse), at the bottom of the hole which currently constitutes the present entrance, a flight of seventeen stone steps descend 2.5m to a half landing. There they turn back on themselves and a further eleven steps descend a further 3m to the floor of the main chamber – the cistern. When Mine Howe was constructed, the water table apparently fluctuated and was higher then it is now (Guttmann-Bond 2001) and this resulted in the lower chamber to periodically fill with water and to act as a cistern, or a well, like in other Orcadian brochs. A channel in the floor of this chamber originally operated as a drain, allowing a choice as to whether the chamber acted as a cistern or not.

The reason and purpose behind the construction of Mine Howe and its ‘cistern’ is uncertain, and unlike many broch wells, Mine Howe is located inland, away from the coast; although it should be noted that when it was constructed, the landscape around Mine was boggy and waterlogged (Card, Downes and Ovenden 2005: 327). It has been suggested that Mine Howe was part of a religious cult of water in which the chamber symbolically acted as an entrance

Figure 7.24. Section of the Underground Structure of Mine Howe. (Crown Copyright: RCAHMS).



into the underworld (Card and Downes 2003a; 2003b: 17; Harrison 2005: 6; Orkney Archaeological Trust 2000). This interpretation is particularly plausible when we consider the special depositions found within disused storage pits at Danebury (see Jones 2007; cf. Cunliffe 1991: 505) and similar locations in Southern Britain, and also bog burials (Briggs 1995; Coles, Coles and Jorgensen 1999; Giles 2009; Glob 1969; Grice 2006; Turner 1995), both of which are commonly argued to have acted as offerings to underworld deities

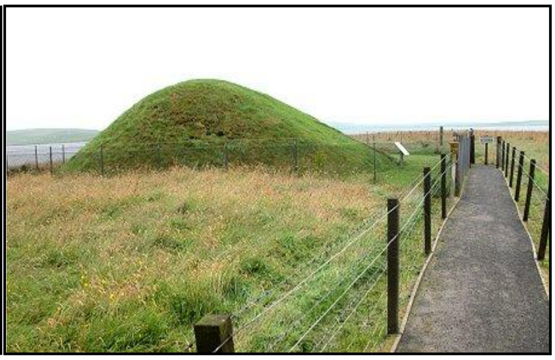
Figure 7.25. Mine Howe and a variety of Orcadian Neolithic Tombs.

Mine Howe Mound.
Author's Photo.

Maes Howe. *Author's Photo.*

Cuween Hll Cairn. *Author's Photo.*

Unstan. *Author's Photo.*



(Aldhouse Green 2001: 167; Cunliffe 1997: 192). However, the unusual Iron Age butchery practices performed on cattle and pig at High Pastures Cave on Skye, as well as the evidence for metalworking and the deposition of human remains in the blocked entrance to the cave, highlights the real potential for underworld veneration in Iron Age Scotland (for Iron Age cave use, see Armit and Schulting 2007; Armit, Schulting, Knüsel and Shepherd 2011; Benton 1931; Layard 1934; Tucker 2010: 208; Saville and Hallén 1994; Shepherd and Shepherd 1995; cf. Branigan 1997; Branigan and Bayley 1989:49; Branigan and Dearne 1991; 1992; Budd and Taylor 1995; cf. Weinberg 1986). But though the 'underworld' may be a relevant theme at Mine Howe, it may be more complex than first imagined.

Certain features of Mine Howe have inspired some to consider the structure to be of Iron Age date (Card, Downes and Gibson 2000; cf. Card and Downes 2003b: 16), and these include: its drystone wall construction, its stone steps and the other techniques used for relieving the weight of the structure (e.g. the corbelled ceiling; wall voids). However, as noted in Chapter Four, though Mine Howe is similar to the architecture of northern brochs, the actual layout of the structure suggests a wish to be in opposition to the broch and there are in fact great distinctions between the two types of site.

First, when descending into Mine Howe, one has to turn to the left when moving down towards the base of the structure. This is in opposition to the intra-mural staircases found within brochs which are almost universally entered on the right-hand side and movement is conducted right-ways (clockwise) around the interior of the structure. Indeed, in Chapter Four, I calculated seventy-six brochs which possess surviving intramural staircases across Scotland, and all but one of these sites (Dun Grugaig on Skye) possesses intramural staircases that ascend in a right-ways direction.

Second, and perhaps more enlightening, is the fact that Mine Howe is surrounded by a substantial ditch, broken by a single entrance orientated to the west; a rare trait for Iron Age (and Neolithic) sites in Orkney which are almost always orientated towards the east and south-east (Crowther 2011: 55); again suggestive of opposition. The interpretation of the ditch and its entrance is also significant here.

Monumental in scale, this ditch possessed drystone riveting of the ditch terminals to enhance this western entrance and approach. However, the purpose of the ditch and this enhanced entrance remains unclear, though it may be emphasising a certain relationship to the underworld; after all, the creation of a ditch is an act of cutting into another world which has thus far lain unexposed (cf. Davies and Robb 2004: 146; Malone 2001: 76). But it may be more complex than this.

In 2005, excavations at Mine Howe aimed to clarify the nature and range of activities that may have taken place subsequent to the construction of Mine Howe and its surrounding ditch. These excavations particularly focussed on an Iron Age metalworking area which had been discovered (see: Card and Downes 2002; 2003a; 2003b; Card, Downes and Gibson 2000; Card, Downes and Ovenden 2004; 2005), where it was found that throughout its history, part of the enclosure ditch had primarily been used as a smithy for the production of ferrous and non-ferrous metalwork, with the primary phase including the use of a large central hearth (archaeomagnetically dated between 100 BC-AD 110), surrounded by evidence for associated activities including small smithing furnaces and anvils.

The role of human agency is hugely significant when interpreting metalworking processes in prehistory (Dobres 1995; 2000; Dobres and Hoffman 1994; Dobres and Robb 2000), and Hingley (1997: 12-13) has previously identified an association between ironworking – particularly smithing – and the dumping of ironworking debris at the entrances to enclosed settlements (which may be significant as it is both peripheral (outside) and a place of access). For example, at Howe on Orkney, ironworking also took place within the entrance of the broch settlement (Ballin-Smith 1994: 165), and at Maiden Castle in Dorset too, ironworking took place in the centre of the ESE facing entrance (Sharples 1991b: 243-4). At Gussage All Saints, also in Dorset, a single pit (209), just to the south of the eastern entrance, produced substantial quantities of bronze and ironworking waste (Spratling 1979), and, as Hingley (1997: 12) notes, fragments of furnace lining in the terminals of Collfryn Iron Age enclosure's western entrance in Powys is suggestive of another peripheral ironworking area (Britnell 1989: 112). At Bryn y Castell too, there is an association between ironworking and the north-eastern entrance to the enclosure (Crew 1986), with the smelting furnace F20 located about 5m north-east of the entrance and with a large dump of ore and slag made against the eastern terminal of the entrance. And indeed, the metalworking activities at Mine Howe were also restricted to the western entranceway of its surrounding ditch (Card and Downes 2003a: 17; Card, Downes and Gibson 2000; cf. Brück 1999: 153; Rees 2008: 70-71).

Western orientations such as this have been argued to relate to the liminal status of metalworking (Parker Pearson and Sharples 1999b: 352), something which is suggested by its association with boundaries and entranceways elsewhere in Britain (Hingley 1990a; 1997). But as the west is a very rare orientation for any broch in Orkney, it suggests a special or sacred significance to this site, distinguishing the enclosure from the 'normal' domestic east or south-east facing brochs. There does indeed seem to be a distinct separation at Mine Howe between the underground complex with its surrounding enclosure and the usual domestic space of the broch. This is not only characterised in the western entrance, but also in the opposing nature of Mine Howe itself. Furthermore, the lowest fills of the ditch were typified by numerous unabraded, undecorated pottery sherds of Early to Middle Iron Age date (Card and Downes 2003: 16; MacSween 2003) and the forms of applied decoration associated with the occupation of brochs in Orkney were absent, thus highlighting the distinction, and isolation, of the site from the usual domestic space of the broch.

The western orientation of the ditch may have thus been intended to set a 'special' or 'sacred' tone here, appropriate perhaps for its status as a metalworking site. Indeed, there seems to have been a special significance attached to the magical nature of metalworking in Iron Age Britain (see: Budd and Taylor 1995; Haselgrove and Wigg-Wolf 2005: 12; Hingley 1997; Rogers 2011: 649), something which is further accentuated at Mine Howe due to its strong relationship with water and with the religiosity which seems to have been given to that element in Iron Age societies across Europe (Derks 1998; Green 1986: 166; Webster 1995: 449-51).

With this in mind, it could be argued that the western orientation of its enclosure did have a 'sacred' significance. This may seem unsurprising when we consider that the west (and the east) is often given special significance, with many cultures associating it with death, as the sun visually dies in the west (see Evans-Pritchard 1962: 145; Faust 2001: 140-141; Gwilt 1997: 164-165; Lubetski 1978; North 1996: 530; Parker Pearson and Richards 1994: 14-17; Waterson 1997: 93). This connection with death may be alluded to in the western entrance of Midhowe broch too, as mentioned earlier, as its unusual western facing doorway frames tidal overfalls – i.e. a place where boats were reversed, death was common, and the watery underworld was turbulent.

But though this suggests an association between the west and 'death', in such a society as Iron Age Orkney, what was death construed as? Afterall, death may be a universal, but the ways that different cultures rationalise it certainly are not.

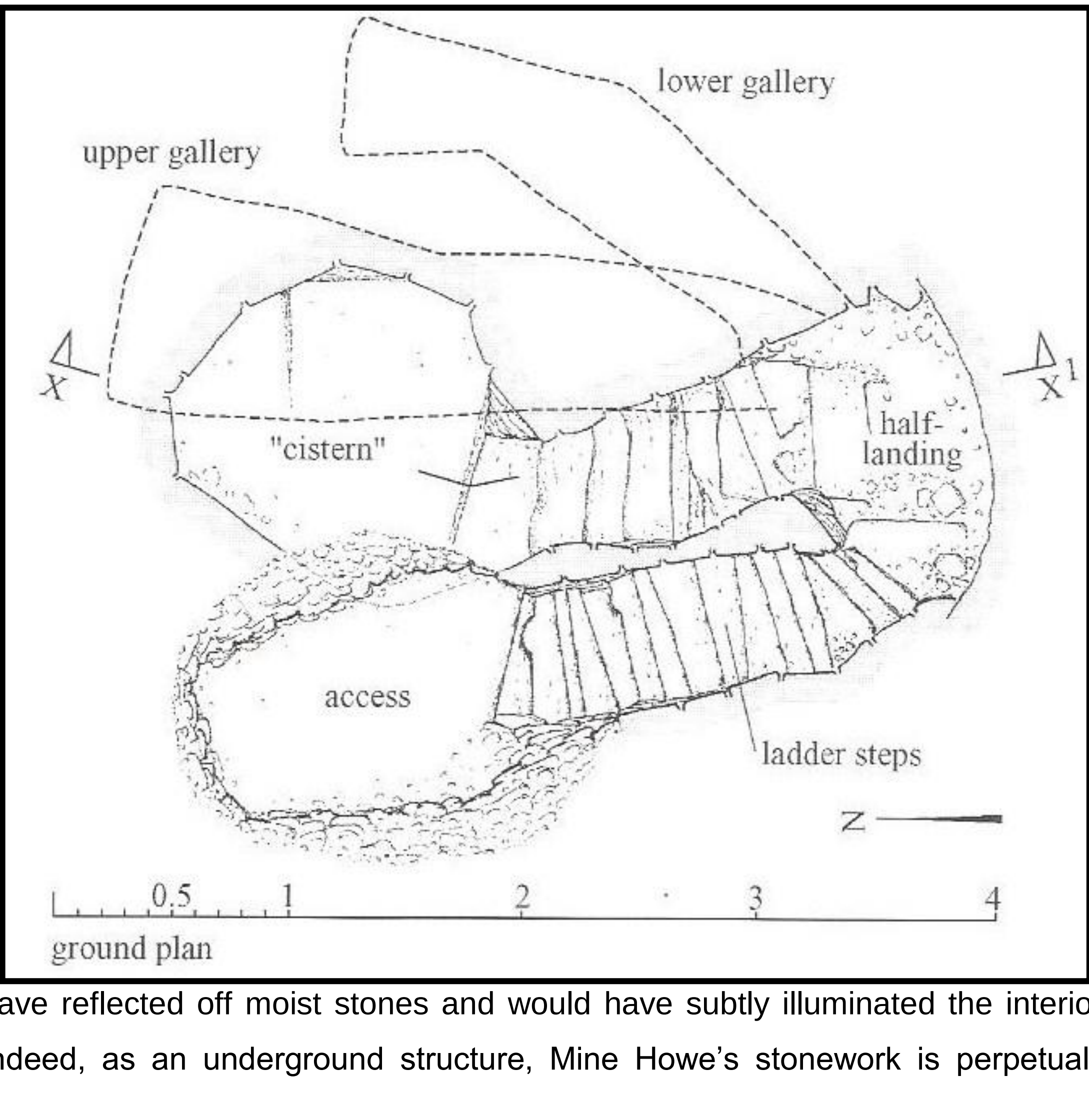
Death may have been believed to be a journey, a departure, a return, or even as a kind of reversal. More likely however, death was probably associated with analogous themes such as 'transitions' and 'transformation'. Indeed, the west does not just mark the daily disappearance (or death) of the sun, but also the time of year between winter and summer – i.e. the spring/autumn equinox; the time when the lighter half of the year meets the darker half.

If anything then, the west is an orientation of 'transformation'; the departure of one thing, and the arrival of another. But the west represents a transformation from a world of light to one which is dark – a night-world. So in moving through the western entrance of Mine Howe, one may have metaphorically stepped into this night-world; a theme which is then mimicked in the intentionally dark and subterranean nature of Mine Howe itself, which, like the sun in the west, delves underground, omitting all sunlight as it does.

On this note, like broch wells, light is conspicuously minimised at Mine Howe. The top flight of steps into the underground chamber faces north, limiting the amount of light into the structure – though it doesn't annihilate light completely, especially near the entrance. But as the steps descend they turn around on themselves back towards the north (Figure 7.26), thereby limiting daylight admission to its absolute minimum in the lower 'cistern' chamber.

A gradually descending staircase would have drawn in more light as sunlight would have channelled down onto the half-landing, even if the entrance did face north. If a darkened environment was required, as it seems to have been in Orcadian wells, this would have been detrimental to the effect as sunlight would

Figure 7.26. Mine Howe Plan. (Crown Copyright: RCAHMS).



have reflected off moist stones and would have subtly illuminated the interior. Indeed, as an underground structure, Mine Howe's stonework is perpetually damp, and as a result, when I visited Mine Howe on a dry summer's day, the entirety of the subterranean structure, not just the ‘cistern’, was wet; the surface of each stone was smooth, water worn and damp to touch. The walls are thus reflective (Figure 7.27), and so even the subtlest light can illuminate the interior. It is assumed that it is for this reason that Mine Howe possesses narrow and steep ‘ladder-like’ steps, permitting light to quickly diminish when descending from the entrance. In fact, these steps are so steep that the builders thought it

Figure 7.27. Mine Howe. Shot of stonework in ‘half-landing’ area. Note the damp stones. *Author’s Photo.*

necessary to provide small spaces for feet above each subsequent step, meaning that one descends as though descending an actual ladder (Figure 7.28). Again, there is reversal because one approaches the objective of the cistern with their back towards it rather than their front. Notably, this is reminiscent of the steep flights of steps which are also to be found leading into the wells at Gurness, Midhowe, Knowe of Redland, Warebeth Cemetery, and at Jarlshof in Shetland; further suggesting the need for the dark in these places.

This ladder-like addition seems to have been wished for rather than required as the intra-mural staircases that we find within broch structures are certainly not

Figure 7.28. Mine Howe. Ladder-like Steps. Facing North towards theEntrance. *Author's Photo.*

as steep in Orkney as the stairs within Mine Howe, and instead ascend gradually, gently; even with the great weight above them. Further, the first flight of seventeen stone steps (descending 2.5m to the half landing) is notably steeper than the second set of eleven steps that descend another 3m to the floor of the cistern (Figure 7.29). This means that the stairs upon which daylight shines most are steeper than those in which daylight is completely omitted.

Figure 7.29. Mine Howe. Steps facing down from the 'Half-Landing' to the 'Cistern'.
Author's Photo.

What these architectural features demonstrate is that light itself was intentionally made absent and that the structure and the northern entrance of Mine Howe were intended to maximise this effect. Because of this, one gains a real sense of a dark underworld – or even a night-world – here. But as suggested in its western entrance, Mine Howe's night-world is one that opposes the world of the eastern facing brochs which rise from the horizon of Orkney's coast much like the sun when it rises from the east. Indeed, Mine Howe opposes this world in many ways. This is demonstrated in: (a) the western facing enclosure, (b) the underground structure, and (c) the dim reflections made in the water in the cistern (originally seen perhaps with the use of a small lamp or rushlight); each of which symbolically opposes reality as though they were otherworldly; the western entrance opposing the usual eastern facing broch; the underground structure opposing the upward gesture of the broch tower; and the left-ways movement towards the cistern in opposition to the usual right-ways movement within the broch. But perhaps most important is the reflective image in the cistern that opposes reality by creating an inverse symmetry.

A reflection, whether expressed in a mirror or pool, confuses with its sideways reversal of reflected objects. Indeed, a question that has confused the populations of so many cultures in the past (and present) is: why are objects in a reflection reversed right-left? With water so abundant in Orkney, such a question may have lingered in the minds of its Iron Age communities. It is interesting therefore that the structure of Mine Howe mimics this reversal: i.e. the left-ways movement of its staircase as opposed to the right-ways movement of the broch, and the western entrance opposing the usual east. We should also bear in mind however that the tower of the broch, so often located on the very edge of water (and sometimes even within it), was well situated to reflect itself upon the water's surface, creating in effect an opposing image of itself within the water; with the reflection of the tower appearing reversed (like Mine Howe), under the water's surface. As a result, Mine Howe may have been intended to act as the reflection (i.e. a reversed mirrorworld) of the broch tower itself; perhaps with the underworld acting as a mirror image of the world above it.

This is speculation of course, but what is obvious is that Mine Howe was an intentionally dark and reversed world; the purpose of which is unclear. This raises the issue of how we should tackle the idea of the underworld; something which is obviously going to be tricky. Indeed, as our own society (i.e. Western) has been particularly influenced by Christian philosophy – both culturally and historically (Schmidt 2004: 12; cf. Brown 2001) – the initial impression one may make upon the term 'underworld' is probably going to be influenced by that theology. As such, it is a theme which will often carry negative connotations; assumingly associated with a dark and menacing 'hell'-like underworld where the sinful are sent after death (Dante 2000; cf. Berstein 1993; Turner 1995). As a common theme across the globe, the 'underworld' is indeed often associated with the dead, and usually represents the afterlife destination (whether for a period of time or for eternity) of human souls (Littleton 2002; Russell 1977: 62; 1984: 144). 'Hades', the Classical Greek kingdom of the dead, is the archetypal example of the dark underworld destination for human spirits (Albinus 2000: 67; Mirtro 2012: 16). Likewise, Norse mythology speaks of 'Niflheim', meaning the 'Misty Underworld'; the afterworld for those who had not died either a heroic or notable death (Davidson 1964).

However, though the underworld tends to act as the final destination of the dead, this is certainly not a universal theme, and elsewhere, the underworld is regarded as the supernatural domain of nonhuman or otherworldly beings such as fairies, demons, giants, monsters and gods. The ‘fairy folk’, or ‘Sidhe’ of Western Ireland for example are thought by many to dwell beneath the earth in ‘fairy mounds’ or within hills (Evans-Wentz 1911; Thompson 2005); a belief which is shared throughout many areas of Scotland too, including Orkney. The underworld in Native American Apache mythology on the other hand is thought to represent the place where the gods reside (Lynch and Roberts 2010: 1); and similarly, in Ancient Greek legend, Zeus was thought to have been born and nurtured underground, within a cave (Kokolakis 1995: 126).

However, as Mine Howe was a metalworking site – and with metalworking interestingly taking place in its western, and metaphorically transformative, entrance – its subterranean, dark and opposing structure certainly suggests a negotiation with a similarly opposing underworld and its non-human ‘Other’; something which is further implied in the structure’s outward appearance; resembling, as it does, the many Neolithic tombs on the islands (refer back to Figure 7.25). This may not be coincidental either, with tombs perhaps being interpreted as special in some way (as they still are by many today; see Blain and Wallis 2004: 241; Wallis 2003; Wallis and Blain 2003); perhaps even being regarded as doorways to the underworld (cf. Green 2000: 54; Kelly 1988; Raftery 1994: 180; Warner 2000) rather than the homes/tombs of the ancestors (see: Hingley 1996: 241; cf. Dillon and Chadwick 1966: 38; Rees and Rees 1961; Lück 2003: 197).

Indeed, these ‘tombs’ – as we now define them – are subterranean, dark, and mysterious places with deadly connotations; places where the remains of the dead would have been found, usually in disarticulated heaps as the excavators of Isbister, Banks and Midhowe (all on Orkney) have discovered comparatively recently. We can also assume that these remains would have been found in most of the chambered cairns that were entered; their blocked entrances equally implying a powerful and perhaps dangerous presence within. On that note, one can imagine that those few Orcadian Iron Age roundhouses which were built atop certain Neolithic tombs/structures (e.g. Howe, Quanterness) were not intended to act as statements of ancestry (e.g. Hingley 1996), but were potentially expressing an appeasement or negotiation with the

'Otherworldly' forces perhaps thought to reside within these already ancient constructions.

Like broch wells, which may have acted as negotiators with dangerous watery realms, Mine Howe may have likewise acted as a form of sympathetic magic with an opposing and non-human underworld from which precious materials were extracted and transformed into cultural artefacts within the enclosure's entrance. But it is assumed that unlike broch wells, negotiation here was necessary for a transformative and productive process (i.e. metalworking), and many artefacts created here would have also been used in the process of agricultural production (e.g. ploughs). Because of this, there may have been a link between metalworking and agricultural produce, and as such, its status as a metalworking site may have been connected to ideas of agricultural fertility, productivity and creation (cf. Hingley 1997), and the water within the well may have been integral to such meaning.

Water as Destroyer and Benefactor

Although Mine Howe may relate to an opposing underworld, its possible association with agricultural productivity means that its opposition may equally relate to a gendered homologous relationship between the broch and well-like structures, with the broch providing a male counterpart to the containing 'womb' of the well; with the 'womb' perhaps being an appropriate metaphor for the creation of artefacts here (for homologous examples based on gender and form, see: Jamie 2005: 2-22; MacKenzie 1991; Sillitoe 1988**;** Strang 1999). Wells and water immersion in general have been described as a 'return to the womb' (Odent and Johnson 1994; Strang 2005: 100), and indeed, water is in many societies expressive of fertility, potentiality and germination, with the 'womb-like' container of the well often being associated with these themes (Bord and Bord 1982: 98; Molyneaux 1995; Strang 2006: 74; Varner 2009: 117). The possible reasons why such creationist symbolism is ascribed to water is complex however.

Influenced by Jungian and phenomenological philosophy, Eliade (1969: 151-152) has previously attempted to answer why this may be the case in so many societies:

‘The Waters symbolise the entire world of the virtual; they are the fons et origo, the reservoir of all the potentialities of existence; they precede every form and sustain every creation. The exemplary image of the whole creation is the Island that suddenly ‘manifests’ itself amidst the waves. Conversely, immersion in the waters symbolises a regression into the pre-formal, reintegration into the undifferentiated mode of pre-existence. Emergence repeats the cosmogonic act of formal manifestation; while immersion is equivalent to a dissolution of forms. That is why the symbolism of the Waters includes Death as well as Re-Birth…[U]pon the cosmological no less than upon the anthropomorphic plane, immersion in the Waters signifies, not a definitive extinction but a temporary re-entry into the indistinct, followed by a new creation, a new life or a new man, according to whether the nature of the event in question is cosmic, biological or soteriological. From the point of view of structure, the ‘deluge’ is comparable to a ‘baptism,’ and the funerary libation to the lustrations of the newly-born’.

It is thus implied that such symbolism is common because water not only precedes and sustains life, but immersion within it is equal to a ‘dissolution of forms’ – i.e. it is ‘a temporary entry into the indistinct’. It is, in essence, the liminal element of being; as Jung (1968: 21-22) himself expressed: ‘It is the world of water, where all life floats in suspension; where [...] the soul of everything living, begins; where I am indivisibly this and that; where I experience the other in myself and the other-than-myself experiences me.’ With such themes attached to this element, it is no wonder then that water is a familiar metaphor in the death rituals of anthropological (see: Hooykaas 1973: 22-23; Wirz 1928: 51-105) and classical literature, with the River Styx of Homeric legend demonstrating well how water not only represents the two planes of existence but also acts as a separation and a passage between them (Tuzin 1977: 202).

All in all then, water acts as a universal symbol of life, death, rebirth and renewal; it is, essentially, an element in which one awaits creation. These seem like appropriate metaphors for the womb-like well and metalworking activities at Mine Howe, with smithing often being associated with magic, initiation, procreation, fertility, rebirth and death (for various examples, see: Barndon 2004; Brown 1995; Childs 1991; Collette 1993; Dockrill and McDonnell 2005; De Barros 2000; Giles 2007c; Herbert 1993; Hosler 1995; Huffman 1996; Lück

2003: 198; Read 1902; Rees and Rees 1961: 253; Rowlands and Wanier 1993; Schmidt 1997; Van der Merwe and Avery 1987; Wembah-Rashid 1969).

Indeed, smithing, essentially involving the death of one thing and the creation of something else, emphasises exactly what water within a well expresses universally: the possibility between worlds; between life, death and rebirth. This would explain why metalworking, as a powerful and transformative act, was able to take place at Mine Howe; a craft often associated with fertility, regeneration and agricultural production, as noted (see: Giles 2007c; Hingley 1997). Here, the materials of an opposing underworld were able to be metaphorically renewed (or reborn) into artefacts for the outside world. However, because water – as the liminal element between worlds – can also represent death, as well as rebirth, one can imagine that such negotiation would have been regarded as dangerous; much like the relationship broch wells may have had with turbulent waters in the landscape.

And on this note, there is something particularly menacing, even deadly, about Mine Howe: the outward appearance of a Neolithic tomb; the western entrance of its enclosure; the dark and opposing subterranean world; the damp and steep steps which descend into it; and the dim pool of water at its base, within which dim reflections would have appeared.

The latter (i.e. reflection) is a potentially complex and influential factor which the modern and secular (or sceptical) mind may overlook. Indeed, within the reflective pool at the base of Mine Howe (and within broch wells too) lay the potential interpretation of another world, within which uncanny, ghostlike images would have appeared, and which would not have been able to be explored through touch (Gregory 2008: 102). The low light and dark conditions in the cistern would have also created distorted, almost ethereal images rather than the clear, vivid reflections of the modern mirror; and this would have only emphasised the sense of another world upon the water's surface. We can imagine then the unaccustomed viewer would have been both fascinated and apprehensive at the sight of themselves within the pool.

Carpenter (1976), a visual anthropologist, introduced mirrors to members of an isolated tribe (the Biami) who dwelt within the Papuan plateau. Here, the rivers were murky and there was neither slate nor any metallic surfaces that could provide a clear reflection. Recording the initial reaction of adults confronted for the first time with a large mirror reflection of themselves, Carpenter stated:

‘They were paralyzed: after their first startled response – covering their mouths and ducking their heads – they stood transfixed, staring at their images, only their stomach muscles betraying great tension. Like Narcissus, they were left numb, totally fascinated by their own reflections: indeed, the myth of Narcissus may refer to this phenomenon’ (Carpenter 1976: 452-453).

It is no wonder that one’s reflection can instigate such a response, as they aid self-awareness and lead us to reflect on mortality (and thus danger). On a similar note, Elkisch (1957; cf. Haglund 1996: 226) has argued that for many traditional societies, reflections are seen to be enigmatic and uncanny, and also tend to be associated with danger. This, he argues, is especially true with regards to seeing one's own reflection as it is usually associated with death because the image seen tends to be interpreted as the viewer’s soul. As it appears external to the body, the person thereby believes themselves to be vulnerable to death.

For Iron Age Orcadians, whether reflections were seen to be gateways to other worlds in which the dead were present is unknown, but it interesting that, like Iron Age mirrors, broch wells, when not in use, were sometimes covered (e.g. Wetwang Slack and Garton Slack mirrors; see: Giles and Joy 2008: 22). I am not suggesting a direct cultural link between Iron Age mirrors and Orcadian ‘wells’, but what I am alluding to is the potentially dangerous and otherworldly nature of reflections (and the logical desire to protect oneself from that). The fact that some wells were covered certainly suggests a wish to contain or hide something, and this parallels the covered nature of Iron Age mirrors from Southern Britain. The veiled reflections (in essence, the omittance of light from its surface) suggests that it was the reflection itself that was meant to be hidden rather than the artefact in question; maybe because of its otherworldliness or relationship to death, understandably.

However, although I believe that the reflection within the base of Mine Howe was probably regarded as uncanny in some way (and may have even inspired the reversed nature of Mine Howe itself), the most perilous factor of this site is likely to have been the metalworking process which took place in its western entrance, in which materials drawn from the earth were transformed using fire, air and water; a process which essentially sought to trap and concentrate potentially otherworldly forces into cultural artefacts (see: Hosler 1994; Lechtman 1993; Saunders 2004: 124). Such perilous – even deadly – negotiation can even be extended to those brochs which possess wells and overlook turbulent waters (e.g. Breckness, Warebeth Cemetery, Broch of Burrian), and which are often located in vulnerable areas of coastal erosion too (e.g. Gurness, Breckness, Burrian). Of these, the western facing broch of Midhowe stands out; a broch sharing many features with Mine Howe.

Like Mine Howe, metalworking took place at Midhowe (Callander and Grant 1934a: 510), and as noted, metalworking is often associated with boundaries, entranceways and liminal places in Britain (Hingley 1990a; 1997; cf. Buchsenshutz and Ralston 2007; Sharples 1991b: 243-244), and this is accentuated at Midhowe due to its closeness (and western facing doorway) to the dangerous overfalls of Eynhallow Sound. These features alone provide Midhowe with a strong sense of the 'Other' (and of danger), and this is further highlighted not only by two cup-marked stones built into the building's fabric, but also by the fact that this broch was built curiously close to Orkney's largest Neolithic stalled cairn (Callander and Grant 1934b) – a rare act in Iron Age Britain; perhaps due to the 'Otherness' possibly ascribed to these structures. Here, like at Mine Howe, the 'sacred' significance of water also seems to have been exaggerated from the 'usual' broch, and though possessing a well in the northern quadrant of its courtyard, a spring also uniquely supplied water to a tank in its southern quadrant (Callander and Grant 1934a: 454).

These features, and the similarities they share with Mine Howe, attest to a possible relationship between water, western facing sites, metalworking and subterranean chambers in Orkney; all of which emphasise boundaries, liminality, otherworldliness, opposition and perhaps even a negotiation with the non-human 'Other'. At the same time, the water within the well, paired with the metalworking that occurred in these places, hint towards potentially dangerous themes such as death and transformation, while also alluding to generative notions of fertility, rebirth and creation. But, although water was integral to these places, what of that other quality which these underworlds naturally engender – darkness. Indeed, these structures specifically sought the dark, and for this reason, the dark must have been given special significance in Iron Age Orkney, just like water. If we are to explore the concept of these watery underworlds further then, we need to examine the 'dark' itself; how it can be linked to water and how it may have inspired such underworld mythologies to exist in the first place.

A Creative or Destructive Darkness?

As suggested in Chapter One, the intimidating sense of 'Otherness' which the darkness engenders has been partially – though certainly not universally (see Morris 2011) – lost in modern and industrial cultures (see: Ekirch 2001; Verdón 2002; Wolkomir and Wolkomir 2001; Neale and Littledale 1976). Indeed, though it was a powerful force in the past, the impact of the dark is largely overlooked within our electrical society. Perhaps it is because of this that the ways in which light and dark were conceived in the Iron Age has only marginally been explored by archaeologists, as noted in Chapter Four; though interpretations tend to simplify the theme of darkness. For example, in accordance with the cosmological model, Fitzpatrick (1997b: 77) suggests that the admission of sunlight into the eastern facing Iron Age roundhouse may have symbolised the 'dawning of the day and of light over dark' and by association, marked 'life over death'. Roundhouses which only admitted western sunlight (due to their western orientation) however may have been considered as the opposite: 'profane, dark, associated with death and barrenness' (Parker Pearson 1996: 127).

Such conclusions may at first seem logical – light represents life, darkness alludes to death. However, there is also an assumption here that light and dark are opposing binary states, and that these naturally inspire universal analogies. As expressed within structural theory, certain opposing binary states (e.g. life:death, left:right, up:down) do exist and they are universal because they represent the absolutes of human comprehension. However, I would argue that the apparent binaries of light:dark, night:day are not distinct opposites but possess varying degrees, as noted originally in Chapter One. They do not distinctly oppose one another, as Lück (2003: 198) also notes, and so we should be cautious in assuming that what are actually polarities (e.g. light and dark, night and day) should be regarded in the same way as universal binary states such as life:death, left:right, up:down, movement:inertia.

Polarities can, however, create metaphorical tendencies that inspire and influence human action, and so many cultures may relate the dawning of the rising sun for example with life and lightness, and the setting of the sun in the west with death and encroaching darkness (see: Altman 1959; Bar-Yosef, Hershkovitz, Arbel and Goren 1983; Hershkovitz, Arbel, Bar-Yosef and Goren 1985; Evans-Pritchard 1962: 145; Faust 2001: 140-141; Lubetski 1978; North 1996: 530; Parker Pearson and Richards 1994: 39; Tambiah 1969). But we should remember that this does not necessarily make these metaphors universal, nor do they always inspire human action. Darkness is not necessarily a *universal* profanity to be linked with 'death' and 'barrenness' (Parker Pearson 1996: 127) either.

Indeed, such assumptions are influenced, to a large extent at least, by the history of western thought, in which light has become an influential metaphor of existence, clarity, truth, salvation and even the divine (Blumenberg 1993; Vasseleu 1998), whereas the dark has traditionally been understood as a frightening, mysterious void, as noted in Chapter One. However, we need to also recognise that these metaphors are *common* within societies across the globe, and it is undeniable that in many cultures (western and non-western), darkness is often associated with death, evil, profanity, illness (Closs 1989; Halliwell 1996; Mester 1990: 213; Saunders 1998: 229; Strathern and Strathern 1971; Whitehead and Wright 2004), and also, the unconsciousness (Jung 1963; 1968).

I would argue that one of the reasons for this is the ways in which light and dark share qualities with the shades 'black' and 'white', which are opposites to one another – binaries – with both representing the absolute limits of our understanding: black being absolute absence and white representing absolute presence. Naturally obscuring detail and leaving us blind and vulnerable, complete darkness is often linked with 'blackness' – the total *absence* of light. The dark can lack in both light and colour, and so we tend to associate darkness with absence, and as we also relate darkness with night (i.e. the absence of the sun), the dark can be indicative of a sense of coldness too.

It is the relationship that darkness and blackness fosters with feelings of absence, vulnerability and coldness which perhaps helps us form a way that we can comprehend one of the human binary absolutes – death (i.e. the absence of life). Light, like white, represents *presence* however, as it reveals spaces and allows us to see with clarity. Elements that provide us with warmth (the sun; fire) and thus life, also grant light, and so we tend to associate light with warmth and life.

However, taking these metaphorical *tendencies* of 'light as life' and darkness as its opposite (i.e. death) and regarding these as universal analogies ignores the social and historical contexts that create and nurture cultural metaphors and individual agencies. Although it seems clear to us that themes such as death and darkness (and even the west; i.e. the setting sun) correlate and link well with one another, this is not a universal truth, and indeed, I would argue that the darkness can actually be highly immersive; linked to fertility and heightened awareness.

As alluded to above with regards to Mine Howe's western entrance, the darkness which is ushered in when the sun sets in the west does not necessarily represent 'death'; a word which, in our modern and (supposedly) secular society at least, suggests a complete ending rather than a possible new beginning (see: Aries 1974; Giddens 1990; Grainger 1998; McManners 1981; Parker Pearson 2003: 142). The dark is more complex than that, and as it slowly encroaches across the landscape at the end of the day, darkness (i.e. night) actually represents a powerful and transformative period of sensory immersion which engenders a completely different sense of self to that which might be experienced during daylight hours, both in relation to the landscape and to other people or beings within that landscape (see Handelman 2005).

Indeed, as highly visual creatures, we become greatly disadvantaged in the dark (Sorensen 2004); details become obscured, depth and distance become difficult to judge, and colours fade[16]. Within darkness then, our senses are forced to recalibrate themselves to their new environment, and one is obliged to 'see' by drawing on other senses such as touch, smell and hearing. Because of this, everything becomes heightened in the dark and new orders of connection assert themselves: sonic, olfactory, and tactile. As anyone who has ever walked within a darkened landscape can appreciate, following a somewhat intimidating period of acclimatisation in which the senses reassert themselves, 'the dark' can become a textured realm of sensory perception, and can thus be regarded as presence rather than absence (though without sight, 'presence' may be regarded as the 'Other'). I would thus argue that because our bodies are forced

[16] Notable here is the possibility that Scottish Iron Age populations were better adapted to dark environments than modern westerners (who live with the benefit of electric light; e.g. street lighting), and probably developed ratios of sensation that were uniquely suited to their environment (see Dawson et al. 2007: 21), as noted in Chapter Five.

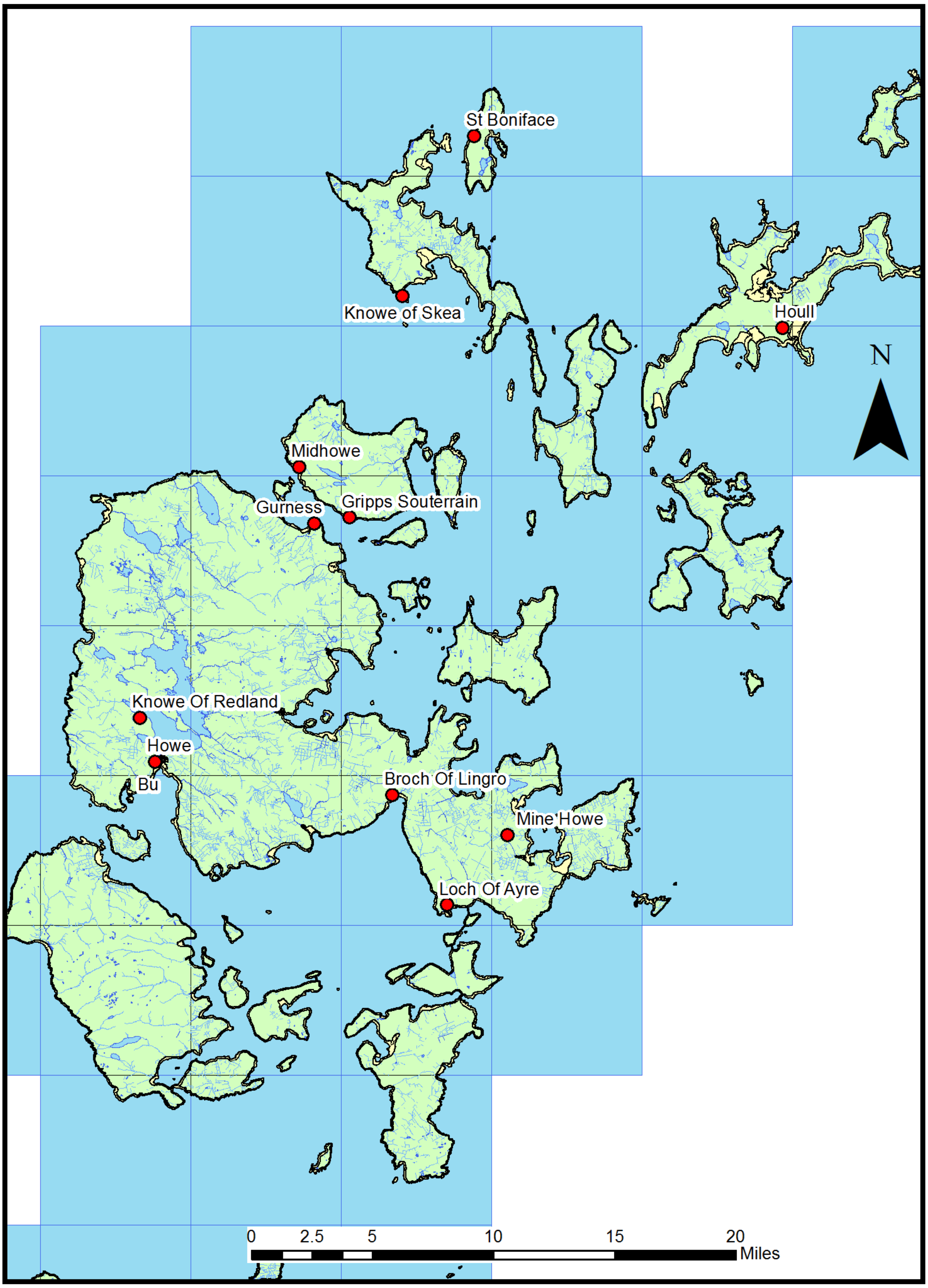
to attune themselves to their greatest extent when light is absent, life can best be manifest in the dark, and for this reason, I would hesitate to associate darkness with death, absence and profanity, and to then regard this as an obvious universality across all human cultures. This is not to say the dark is not dangerous however, as hinted above.

In the dark, one gains the potential to become invisible; inducing a sense of being anonymous and unobservable (Zhong, Bohns and Gino 2010) while also offering protection and camouflage. This can be a liability however, because behaviour also becomes hidden in the dark, and so social concerns become reduced. As a result, darkness can inspire risky and antisocial behaviour (Hirsh, Galinsky and Zhong 2011; Prentice-Dunn and Rogers 1980), and it is this capacity to induce behaviour outside the remits of social norms (i.e. to hide us from the social world) that renders the dark an intriguing, liberating but also a dangerous force, thereby warranting its association with social deviance, disorder, chaos and that which is hidden; indeed, it is probably no coincidence that the word 'Hell' – a theme which is certainly relevant with regards to a dark underworld – ultimately derives from the Proto-Germanic 'Halja', meaning 'one who hides' (Barnhart 1995: 348).

This is certainly not the only way the dark can intimidate however. After all, the darkness is all-consuming; all-enveloping, lacking edges and boundaries and appearing limitless (Otto 1950: 70, 220; Zajonc 1993: 2). However, one of its most unsettling facets is its ability to confuse our sense of distance (which seeing necessarily implies) to the extent that we collapse into the 'Other' in the dark; collapse into hidden realms (see Heijnen 2005). Indeed, because darkness erases shapes, forms, boundaries and surfaces, our surroundings appear to dissipate into the dark itself, losing their distinctiveness and identity, and providing one with the feeling of being in the presence of the unknown, or the supernatural 'Other'. Light, which is the very precondition for seeing, can be manipulated in order for us not to be drawn into those hidden spheres; to emphasise the outward forms and shapes of objects, illuminating their boundaries, and exposing the nature of their spatial surfaces and appearances in order for us to remain within the secure boundaries of 'solid' reality.

It is thus the dismantling of that solidness which makes the darkness powerful (and scary); engendering, as it does, a temporary dissolution of those who are essentially consumed by it; fostering feelings of uplifting liberation (by hiding us from the social gaze and heightening our non-visual senses), while at the same time, providing one with a sense of unsettling surrender (Morris 2011: 316). This dissolution into that which is no longer known means the darkness also represents the 'indistinct' (like water), and also just like water (Eliade 1969: 151-

Figure 7.30. Sites in Orkney with Evidence of Middle Iron Age Metalworking.



152; Jung 1968: 21-22), one thus awaits creation in the dark – one awaits the secure ‘solidness’ that light brings.

Creation thus ‘begins with darkness’ (Cameron 1992), and indeed, it often symbolises the precondition of all things (again, like water; see: Strang 2005: 101); as Helms (2004) argues, the dark stands closer than light to ultimate cosmological beginnings, with darkness often being identified in lore and legend as one of the conditions that preceded the formation of the lighted universe. Indeed, within creation myths across the world, darkness (and also water) features heavily, with many depicting a dark amorphous, undifferentiated, sometimes chaotic primordiality preceding the appearance of an illuminated, formed, ordered and organised cosmos (Niditch 1985; Pritchard 1966; Van Over 1980; Wakeman 1973: 86). For example, within the Hermopolitan cosmology of Ancient Egypt, an infinite, dark and watery chaos existed prior to creation (Wilkinson 2003). The Hawaiian ‘Kumulipo’ creation myth likewise reveals a dark chaotic universe which moves gradually towards light (Beckwith 1970; 1972; Knipe 1989). But perhaps most familiar of all is the creation tale of the Old Testament, which repeatedly refers to a chaotic primeval watery darkness as the creational precondition of the uncreated universe – ‘darkness was upon the face of the deep’ (Genesis 1.1-4; see also: Job 26.10; 38.9; cf. Campbell 1973: 297; Chupungco 1977: 82; May 1939; Niditch 1985: 72). With all this in mind, we can refer back to Iron Age Orkney. The integration of water within these intentionally dark, man-made spaces, such as broch wells and especially within Mine Howe, certainly suggests a play on the themes which water and darkness share with one another, and which include: (1) creation; (2) dissolution; (3) liminality; (4) ‘Otherness’ (5) death; and (6) danger; all of which link in very well with the magical nature of metalworking. Indeed, as seen in Figure 7.30, though Iron Age metalworking sites in Orkney had strong associations with watery contexts, especially the sea, perhaps most significantly is the fact that almost all of them possessed some kind of underworld message, as expressed in: (1) Gurness with its well; (2) Midhowe, which possesses numerous subterranean features (as noted above); (3) Gripps souterrain on Rousay, together with, (4) the souterrain of Houll at Stywick Bay on Sanday; both of which speak for themselves; (5) the broch of Howe, with its re-adapted Neolithic subterranean passageway (Ballin Smith 1994; Carter, Haig, Neil and Smith 1984; MacKie 1998; McDonnell 1994); (6) Knowe of Redland broch

(Petrie 1873: 84), with its underground well, and it has also been suggested that the broch was originally constructed within a bog too (Fraser 1927); (7) Loch of Ayre broch, partially constructed within the loch, and also possessing a well; (8) the south-west facing and subterranean dry-stone construction at Knowe of Skea on Westray (Moore and Wilson 2005: 330), which apparently acted as both a metalworking site and a funerary complex, running from between 200 BC to AD 400 (G. Wilson, personal communication, January 16, 2013); (9) the souterrain underneath Bu roundhouse (Hedges and Smith 1980); and of course, (10) the underground structure of Mine Howe itself.

Conclusion: The Underworld as a Major Theme in Iron Age Orkney

The original aim of this chapter was to move away from the purely map-based approaches of the previous two chapters - which I believe can allow the subtle message to often be missed - and begin to examine the potential cultural and cognitive perspectives that lie behind the record. To do that, I narrowed the scope of the thesis onto the Orkney Islands, where I began to argue that the domestic relationship with water, light and the dark is more complex than may have been suggested in the previous two chapters.

Water's fluctuating relationship with light is obviously a close and powerful one, with the shimmering of light upon water able to mesmerise viewers; something which, in turn, provides this element with a particular uncanniness. Indeed, this relationship, together with the obvious necessity of water in general, has allowed water to be consistently encoded with powerful meanings and attachments. However, without the stories and myths attached to it, we can only wonder at the hidden meaning granted to water and light here. We can be sure that Iron Age Orcadians had clear and strong associations with watery contexts however, especially the sea. Knowledge of the seas and travel along them would have been essential, and the locating of a broch on watery borders may have been a way of associating inhabitants with the significance attached to those seaways. But though watery contexts held great practical value, they would have also inspired symbolic and meaningful attachments too, and to regard the close relationship which Iron Age communities had with water as a practical matter alone would certainly miss the powerful symbolism that was doubtless invested in this element here.

In landscapes dominated by extreme conditions, there tends to be an exaggerated relationship with water (Strang 2005: 99), and the ferociousness and domination of this element in Orkney could undoubtedly have fostered a cult of water here. This is intimated in those brochs impractically built within or upon the edge of water, usually away from more fertile land, and also in the construction of Orcadian wells, located deep inside the earth. These underground structures certainly hint at more than domestic practicality, and allude to a sacred or spiritual significance. Indeed, to construct a well, to commonly place it in the darkest corner (the north), and to then even cover it over and build the home above it constitutes an act of building not only upon water, but also upon the metaphor (and reality) of an underworld/otherworld that was dark and void of light.

Though the reasoning behind this remains unclear, broch wells, often located within a landscape vulnerable to the ferocious seas which surrounded it, were filled with still fresh water, suggesting an appeasement of the turbulent (and undrinkable) waters around Orkney. The well thus alludes to a form of sympathetic magic, with brochs working as both landmarks and negotiators with a dangerous – though also beneficial – fluid realm. When considering the use and purpose of the well then, the influence of an 'otherworld' metaphor may have existed, and no where is the ritual sanctity of these types of structures more apparent then at Mine Howe.

Surrounded by a huge ditch and not located within or underneath a broch, the elaborate structure of Mine Howe is clearly not a domestic site, as no evidence for domestic activity within the area of the mound encircled by the ditch has been found (either through geophysical survey or through excavation). Even if there were domestic structures around this site, it would still be doubtful that this is a secular, domestic well. A simple shaft-like structure would have functioned better as a well (Ritchie 1995: 113), as the ladder-like steps leading down into the cistern form a challenging route, especially in this dark and wet environment. The staircase's elaborate nature thus denies a purely functional explanation in itself, and for this reason, we can consider that Mine Howe, and by association, the integration of well-like features within brochs, constituted a 'sacred' or symbolic act, and were probably associated with an otherworld/underworld, as is also suggested in the desire to expel light from within them.

There is something pertinent in this expression as it is known from classical and Irish texts that Iron Age populations believed in ‘otherworlds’ (or ‘afterworlds’) and that communities often had a wish to manipulate the relationship between them (Chadwick 1970; Piggott 1969; Ross 1967). However, whereas the still water within the broch well may have negotiated with a corresponding fluid realm, Mine Howe – as a metalworking site located inland, away from the coast – may have acted as a mediator with the underworld from which ironworking materials were extracted; a dark otherworld/underworld that was perhaps believed to be teeming with sacred and spiritual significance. The subterranean structure of Mine Howe, with its opposing architecture and its equally opposing reflective pool at its base, thus alludes to a complex conception not just of water, but also of the underworld (and of light and darkness) in Orkney; perhaps bringing together themes such as fertility, rebirth, creation and death.

Rather than something peripheral, water and light seem to have worked as powerful social agents in Orkney, linking multiple themes in a fluid and complicated web of meaning. Together with the myths and stories which would have doubtless been attributed to Orcadian waters, a picture of a sentient environment with its own persona becomes clearer; a living environment which Iron Age populations sought to engage with and be a part of.

Conclusion

As noted in the introduction, the original aim of this thesis was to understand the relationship between Atlantic Scotland's Iron Age communities – and in particular, the broch cultures of Northern Scotland – and light. However, though at first, this may seem to be a fairly simple objective, discovering the role of an element as ephemeral as light within a society of the distant, prehistoric past is – due to the ephemeral nature of both light and culture – always going to be difficult to achieve.

The thesis began by examining the complex issue which is light, in both anthropological and archaeological social contexts. Here, numerous themes became apparent. What was immediately obvious was that our own cultural preconditions are likely to bias our understanding of the record (e.g. Knapp 1996). Indeed, light is an element which is not only infinitely complex and multifaceted, but is also a theme which people in the modern world have largely overlooked and taken for granted. This tricky point highlighted a second which became clearer throughout Chapter One: that any study on light requires a clear picture of the society in question to be formed before even enquiring where and how light may have impacted life within that picture. However, these two unavoidable and complicated avenues of exploration – i.e. (1) gauging the nature of this prehistoric society; and (2), comprehending the infinite number of ways in which light may have impacted life within that society – are further complicated by a separate issue which becomes apparent in Chapter Two: the prevalence of architectural typological studies (e.g. Martlew 1982) and predominantly functionalistic approaches to Iron Age research in Scotland; strongly alluding to Hill's (1989: 17) notion of a 'familiar iron age'; a past where our modern, historically specific values and common sense notions apply.

In this kind of environment, interests which are likely to be unfamiliar (or those which could be considered 'unsafe') are often regarded as unpopular facets of exploration (e.g. phenomenological analysis, and especially studies relating to colour or the natural world such as the social influence of water and light). Indeed, light – an element often taken for granted in our own society – is not given the same degree of attention by archaeologists as what may be considered as more familiar aspects of life, such as agriculture and warfare. Because of this, studies which have explored the role of light in Iron Age

Scotland have been largely been restricted to that which seems most obvious, such as light's influence on doorway orientation; the role of light thereby integrated into the popular (and familiar) avenue of architectural typology.

That being said, the influence of light on the makeup of Iron Age cosmologies, as seen in the cosmological model (a sun-based belief system dictated through the use of domestic space) for example, have been partially explored by those who have perhaps recognised that the approach of the architectural-typologists could never make much headway with regards to understanding the subtitles of human agency and meaning in the past (see Gosden 1999; Wiseman 2001: 12). The problem, however, is that theories on agency, especially agency in prehistoric cultures, are difficult (if not impossible) to scientifically prove or disprove. And indeed, the extension of the cosmological model across Scotland – as explored briefly in Chapter Two and extensively in Chapter Four – led to heavy criticism (Pope 2007; Romankiewicz 2011: 54-57; Webley 2007; cf. MacKie 2010: 104-105); criticism which has not only practically erased debate on the issue of the cosmological model, but has also replaced such approaches with simple and seemingly universal practicality.

This demonstrates how, in archaeology, the empirical facts can constrain our interpretations of the past, alluding to the disappointing but valid point that a truly holistic comprehension of any past society is impossible for us to gain in the present. Indeed, anthropologists find it difficult to attain even a marginal picture of a living culture, no matter how 'straightforward' that society may at first seem to the outsider, and the social residues available to archaeologists constrain interpretation much further. However, though the empirical facts restrict interpretation, they also provide a springboard for multiple understandings (Tilley 2008a: 219), as noted in the Introduction. And so, I would contend that although both sides of this argument are seen to conflict with one another, they are actually complementary and interconnected – as argued throughout this thesis – with both sides holding their own possible truths, or understandings of the past; a duality of 'truth' that is fairly common in archaeological and anthropological debate. Indeed, there is a 'popular truth', which perhaps sees light as a practical necessity (a reflection perhaps of the desire for scientific authority at the expense of maintaining a 'familiar' Iron Age), and an 'unpopular truth', which attempts to understand light as an analogical tool within a wider system of meaning.

However, if one is to gain a broader perspective on light in the past, then it is important to recognise that even if the ‘popular truth’ – i.e. the practical based approach of current Scottish Iron Age studies – is correct, those who hold these views need, for their own good, and for the good of the academic community at large, to be vigorously and earnestly contested. This is because when there is no discussion challenging the view, people will come to believe it as actual and solid truth; something which Pope (2007) was actually against when she noticed the assumptions Iron Age archaeologists were making with regards to the cosmological model and domestic space (though it should be noted that her critiques on the model likewise championed a form of knowledge which is in itself seen as definitive). The reflections we make on the record – our archaeological representations – should seldom be assumed to be true reflections however (see: Binford 1962; Ucko 1969; Hodder 1978; Shennan 1994). Therefore, for any scholar wishing to maximise the empirical content of the views (s)he holds and who wants to understand them as clearly as (s)he possibly can, (s)he must take many different avenues of exploration (cf. Feyerabend 1975: 21).

Due to its complexity, this is imperative with regards to the study of light, and I have hoped to pursue such a methodology here by intermingling what are typically data-based approaches (map-based studies, broad ranging landscape and GIS research; architectural-typological studies) with more qualitative analysis (e.g. phenomenology, ethnographic analogy, folklore analysis). However, I also thought it important that other factors which are significant with regards to the construction and location of the domestic space – though not initially associated with light – should be examined in order to broaden the perspective on the ways in which light can influence society.

Chapter Three, for example, explored the function of the broch structure in its environmental context, illustrating how the vernacular broch sought to deal with the elements during a period of climatic deterioration. This could be seen in: (a) the broch’s drystone construction; (b) its double walling; (c) its rounded nature; (d) its thick and pitched outer walls; (e) its long entrance passages, and (f) its wall voids; all of which suggested a clear awareness of the elements affecting the domestic space. Chapter Three then moved on to look at the role of light and compared the broch’s orientation patterns with those of the blackhouses, suggesting that orientation may have generally been influenced by a desire for light availability and an avoidance of the prevailing wind; thereby initially supporting the more practical approach to light.

And yet, the analysis of Chapter Three, though dependent on the empirical evidence, tells us little with regards to the nature of Iron Age society and the ways in which the broch maintained social values; a theme which could certainly provide us with more detail regarding light’s place in Scottish Iron Age society. Indeed, as is noted in Chapter One, light is much more than a universal requirement, and Chapter Four aimed to give substance to this statement by arguing that although the cosmological model should not be extended across Scotland without consideration of local datasets, certain elements of the cosmological model (i.e. the potential significance ascribed to certain cardinal directions, especially the west, and also the dictation of movement in a sunwise/anti-sunwise direction within the broch) probably did exist in certain areas, and may have even influenced the makeup, and construction, of the house itself.

With the purpose of orientation conformity in Scotland still remaining somewhat inconclusive however, Chapter Five, representing two map-based studies on Shetland and Orkney, sought to understand the nature of light in the landscape, exploring how lightscapes (i.e. the interplay of light and shadow in the landscape) may have influenced broch doorway orientation and site emplotment in these areas. The analysis undertaken within this chapter seemed to initially strengthen the more practical interpretation of doorway orientation, as originally suggested in the analysis of Chapter Three; though certainly not entirely, with the role of idiosyncrasy and seasonality seeming to have played a strong role in the Northern Isles.

What also became apparent in Chapter Five, however, was that water (a significant light reflecting element in itself) seems to also have been an important factor when locating the broch, at least in the Northern Isles, and so the subsequent chapter acted as a supplementary study, diverting away from orientation, light and internal space to examine the Atlantic Roundhouses and their relationship with water bodies across Scotland. This kind of sidestepping was important here because, as noted in Chapter One, light is intimately interconnected and explicable only in reference to the whole, and, as water seems to have been central with regards to Iron Age society across much of Atlantic Scotland, then its significance in the Northern Isles (at least in regards to site location) may be connected to the significance attached to light in these areas also.

Chapter Six thus examined water in its landscape context and analysed Iron Age proximity to different water bodies throughout the various regions of Scotland. From this, it was obvious that Iron Age communities had clear and strong associations with watery contexts, especially with the sea, alluding to a distinctly aquatic-based society throughout much of Atlantic Scotland. This seemed especially true with regards to Orkney, and together with the lightscape analysis of Chapter Five, it became clear that there was a connection between good light and close proximity to water here; something that may help to provide a fuller understanding of the nature of Iron Age society on these islands. For many of Orkney's brochs, the watery contexts which they were positioned near would have had great practical value, and this is what is primarily implied in the data-based approach of Chapter Six. However, I also argued that such a methodology – when used alone – may at best overlook and at worst completely dismiss the more subtle meanings which water held for the maritime communities of Orkney; a significance which may have tied in with that which was also attributed to light.

With this in mind, Chapter Seven acted as a case study, exploring the personal and individual traits of Iron Age communities in Orkney, especially in relation to those brochs where there seemed to have been a relationship between light (as explored in the lightscape-orientation study of Chapter Five), water (as explored in Chapter Six) and a notion of an underworld, all of which are dramatically manifest in the landscape and within the archaeological record of Orkney itself. Building upon the GIS inspired methodologies of Chapters Five and Six, this final chapter primarily sought to approach these themes (i.e. light, water and the underworld) in fundamentally anthropological ways (see Leach 1977: 167); e.g. examining Orcadian folklore in relation to the sea, and examining the ethnographic record to gain perspectives on how water and light are experienced and how they can intermingle to create meaning.

Primarily discussing the significance of the underworld metaphor in Orkney – an upwelling area in Iron Age Scottish studies – and noting the prevalence of underground subterranean Iron Age structures found across these islands, this chapter especially sought to query the role of light and darkness, and the impact that orientation, stone type and water (both within these structures and within

the landscape/waterscapes around them) have on our experiences of these places.
However, in order to reveal the complexities of light (and especially darkness) – a facet I previously explored in largely distant terms in Chapters Three, Four and Five – it was also fundamental that I examine Orkney's underground structures in largely phenomenological terms; i.e. attempting to reveal the world as it is actually experienced by a subject as opposed to how we might theoretically assume it to be (Tilley 2004: 1). Indeed, the darkness which these structures seem to have sought was explored in depth; with the darkness itself seeming to engender a strong sense of the 'Other' within these places.
First and foremost, this approach was intended to illustrate how thick descriptions of place (see Geertz 1973) can contrast with the standard mode of thinking in archaeological description which can often dehumanise the past and make it remote and clinical due to the use of abstracted Cartesian conceptions of space and time. In this way, this personal exploration of water and light attempted to challenge the Cartesian split of nature and culture, to comprehend how these sites may have been experienced (cf. Bender 2006: 306); something which can be extended to other areas and various periods.
In this way, the phenomenological approach of Chapter Seven aimed to make the past not only seem 'present' by interpreting it through the human senses, but attempted to revive it by presenting the observer with a completely new way of interpreting the archaeological record; countering the dispassionate gaze (Thomas 2004b: 199) as noted at the beginning of Chapter Seven, and thereby also countering our own assumptions on how light and water can work together to create atmosphere and meaning. For any study on light, this kind of approach is both relevant and necessary.
Of course, such an approach to the record can be, as Tilley (2004: 220) argues, both 'fragile and democratic'. But the aim of this was not so much to fix and solidify interpretation with regards to the different degrees of light and dark, but rather, it was an attempt to open up debate on issues that have been overlooked; an attempt to widen our perspective, and to create a doorway to new understandings. This is not just relevant with regards to the study of light, but is also significant in relation to the role of water, folklore, and even the influence of the sea too. So in conclusion, although this thesis primarily – or at least initially – sought to represent a study on light, it has also attempted to

reflect broader theoretical issues; not only querying how we should approach the concept of light in any period of history, but how we, as archaeologists, attempt to approach and visualise any past society.

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